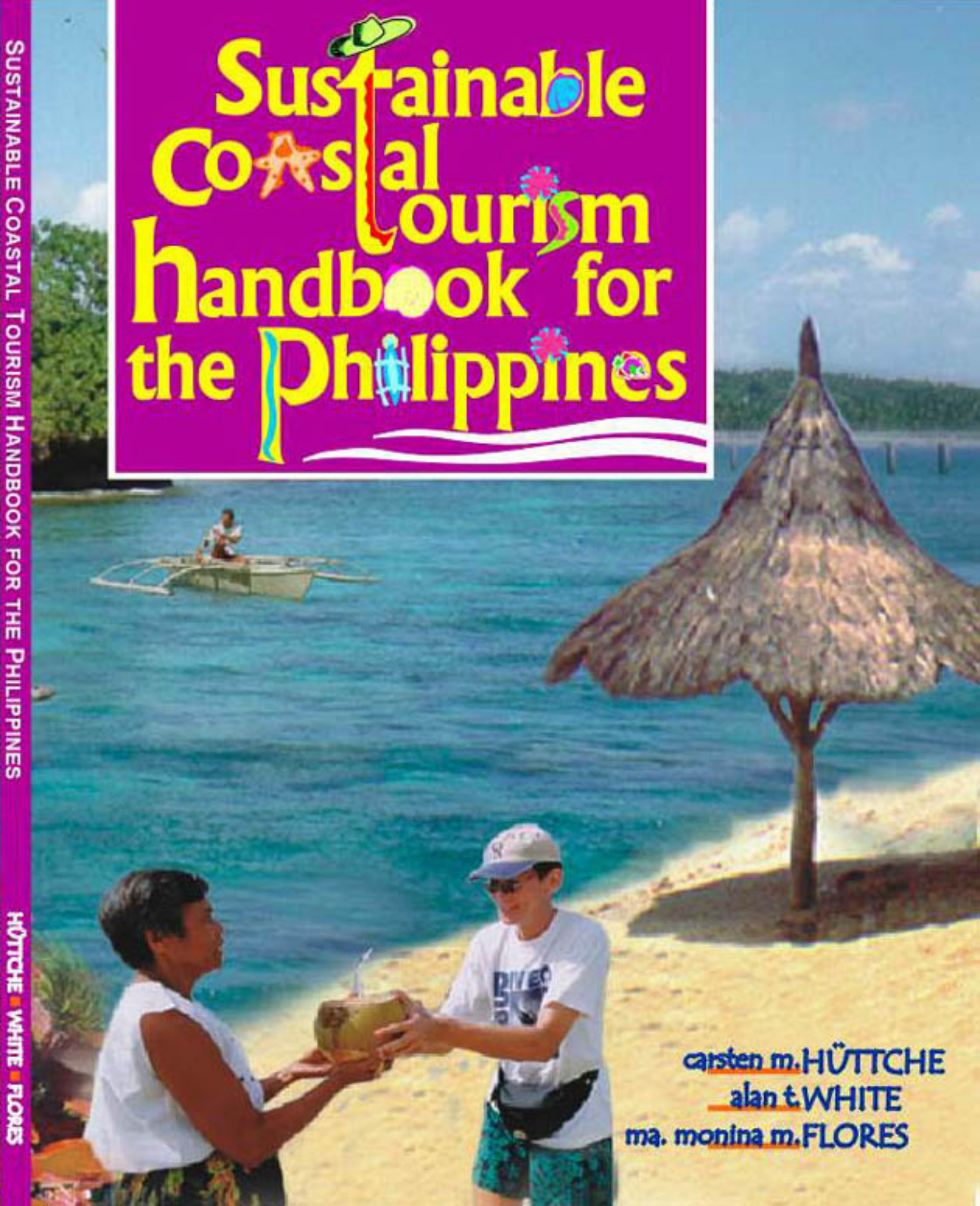
Sustainable Coastal Tourism handbook for the Philippines



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Alan T. White
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Coastal Resource Management Project
of the
Department of Environment and Natural Resources
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in collaboration with the

Department of Tourism

Cebu City, Philippines
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by

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LIST OF ABBREVIATIONS AND ACRONYMS

AO	-	Administrative Order
BBIR	-	Bintan Beach International Resort
BFAR	-	Bureau of Fisheries and Aquatic Resources
BOD	-	biochemical oxygen demand
BRM	-	Bintan Resort Management
CBFMA	-	Community-based Forest Management Agreement
CENRO	-	Community Environment and Natural Resources Office(r)
COD	-	chemical oxygen demand
CRM	-	coastal resource management
DA	-	Department of Agriculture
DAO	-	Department Administrative Order
DDT	-	dichloro-diphenyl-trichloroethane
DENR	-	Department of Environment and Natural Resources
DILG	-	Department of the Interior and Local Government
DO	-	dissolved oxygen
DOT	-	Department of Tourism
ECA	-	Environmentally Critical Area
ECAN	-	Environmentally Critical Areas Network
ECC	-	Environmental Compliance Certificate
ECP	-	Environmentally Critical Project
EIA	-	Environmental Impact Assessment
EIARC	-	Environmental Impact Assessment Review Committee
EIS	-	Environmental Impact Statement
EMB	-	Environmental Management Bureau
EMF	-	Environmental Monitoring Fund
EMP	-	Environmental Management Plan
FARMC	-	Fisheries and Aquatic Resources Management Council
FLA	-	Fishpond Lease Agreement
ICM	-	integrated coastal management
IEC	-	information, education and communication
IEE	-	Initial Environmental Examination
kW	-	Kilowatt

kWh	-	Kilowatt-hours
LAC	-	limits of acceptable change
LGU	-	local government unit
MARINA	-	Maritime Industry Authority
MBAS	-	methylene blue active substances
MIIMPS	-	Mactan Island Integrated Master Plan Study
MMT	-	Multi-Partite Monitoring Team
MPN	-	most probable number
NEDC	-	National Ecotourism Development Council
NGA	-	national government agency
NGO	-	nongovernment organization
NIPAS	-	National Integrated Protected Areas System
PAMB	-	Protected Area Management Board
PAWB	-	Protected Areas and Wildlife Bureau
PCB	-	polychlorinated biphenyl
PCG	-	Philippine Coast Guard
PCSD	-	Palawan Council for Sustainable Development
PD	-	Presidential Decree
PENRO	-	Provincial Environment and Natural Resources Office(r)
PNP	-	Philippine National Police
PO	-	people's organization
PPA	-	Philippine Ports Authority
PTA	-	Philippine Tourism Authority
PV	-	photovoltaic
REC	-	Regional Ecotourism Committee
RED	-	Regional Executive Director
SEP	-	Strategic Environmental Plan
SIA	-	Social Impact Assessment
STP	-	sewage treatment plant
TDS	-	total dissolved solids
TSS	-	total suspended solids

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This book depends on many excellent information sources from the Philippines and elsewhere concerning the development and management of tourism. These references are listed at the end. Much of the material is derived from the various publications of the Coastal Resource Management Project of the Department of Environment and Natural Resources and supported by the United States Agency for International Development.

PREFACE

This handbook provides guidance to the tourism industry through practical tools and strategies to avoid unnecessary environmental and social problems associated with tourism development. Its audience includes tourism developers and operators of small to large tourism projects, coastal communities, local government units and national government agencies. The book promotes the goals of government and the private sector to restore a tarnished coastal environment back to clean beaches and crystal-clear waters for long-term business and environmental viability.

The Philippines is plagued with unplanned coastal development. In the past when coastal areas were sparsely populated and coastal resources plentiful, haphazard development and resource exploitation were not major concerns to people. Now, the situation is very different and the carrying capacity of many coastal areas has been surpassed. Population density in the Philippine coastal zone is among the highest in the world and the obvious lack of development planning and mitigation is taking its toll in degradation of beaches, coral reefs, seagrass beds and water quality in shoreline and nearshore areas.

The tourism industry depends on a clean and healthy environment. Indeed, travel industry trends are shifting towards more demand for destinations that offer pristine environments, experiences with nature and at least a lack of pollution and civil society problems. Philippine coastal areas could lose their attraction if issues of pollution, overcrowding and unplanned development are not addressed. The tourism industry has an opportunity in improving the situation by identifying creative means to assist and guide development with an eye for environmental preservation—knowing that well-managed coastal areas will attract more visitors.

Tourism players can look at smart and appropriate solutions for waste treatment and for shoreline land use. They can become more proactive in guiding tourism development so that it contributes to coastal management and resource conservation. Indeed, this handbook points to practical, robust and cost-efficient systems for environmental protection and management that can be easily operated and maintained.

This handbook contains a wealth of information to help guide tourism developers, local governments, nongovernment organizations and the many other stakeholders concerned with tourism in the Philippines. It provides guidance at both the policy and field levels. It can help with site plans and organizing environment sensitive recreation uses of coastal areas. It can answer many questions that need to be asked about how to better maintain our coastal areas for tourism and other uses. Let's read and make use of its guidance on Philippine coasts!

CHAPTER 1

Introduction—Tourism and Coastal Ecosystems

Tourism is now the largest industry in the world. Although it can bring substantial economic benefits, it has many pitfalls that can easily erode the gains.

Coastal Tourism in the Philippines

"Coastal tourism" brings up popular images of resorts at the seaside with white sandy beaches lined with coconut palms and crystal-clear waters. Advertisements and travel trade literature have helped to promote this image of the three "S's" that coastal resorts usually offer—sun, sea and sand.

A fourth "S", for sex in the form of flourishing prostitution, has created social and cultural problems in many popular coastal tourist playgrounds around the world, especially in developing countries. And finally, a fifth "S" has found its way recently into news headlines and, more disturbingly, into the coastal waters in front of beach resorts: sewage.

The purpose of this handbook is to provide tourism developers and operators of small to large tourism projects, coastal communities and local government units (LGUs) with practical tools and guidance to avoid unnecessary environmental and social problems from tourism development. The ultimate goal of government and private sector is to restore a tarnished coastal environment back to clean beaches and crystal-clear waters for long-term business and environmental viability.

Tropical coastal areas have major advantages compared with the coasts in the temperate climate zones. They are better suited to offer the combination of sun, sea and sand to tourists year-round. The Philippines' tropical climate and diverse 18,000-kilometer coastline on more than 7,000 islands have made it an important area for coastal tourism development. Important coastal tourism destinations in the Philippines are shown in Figure 1.

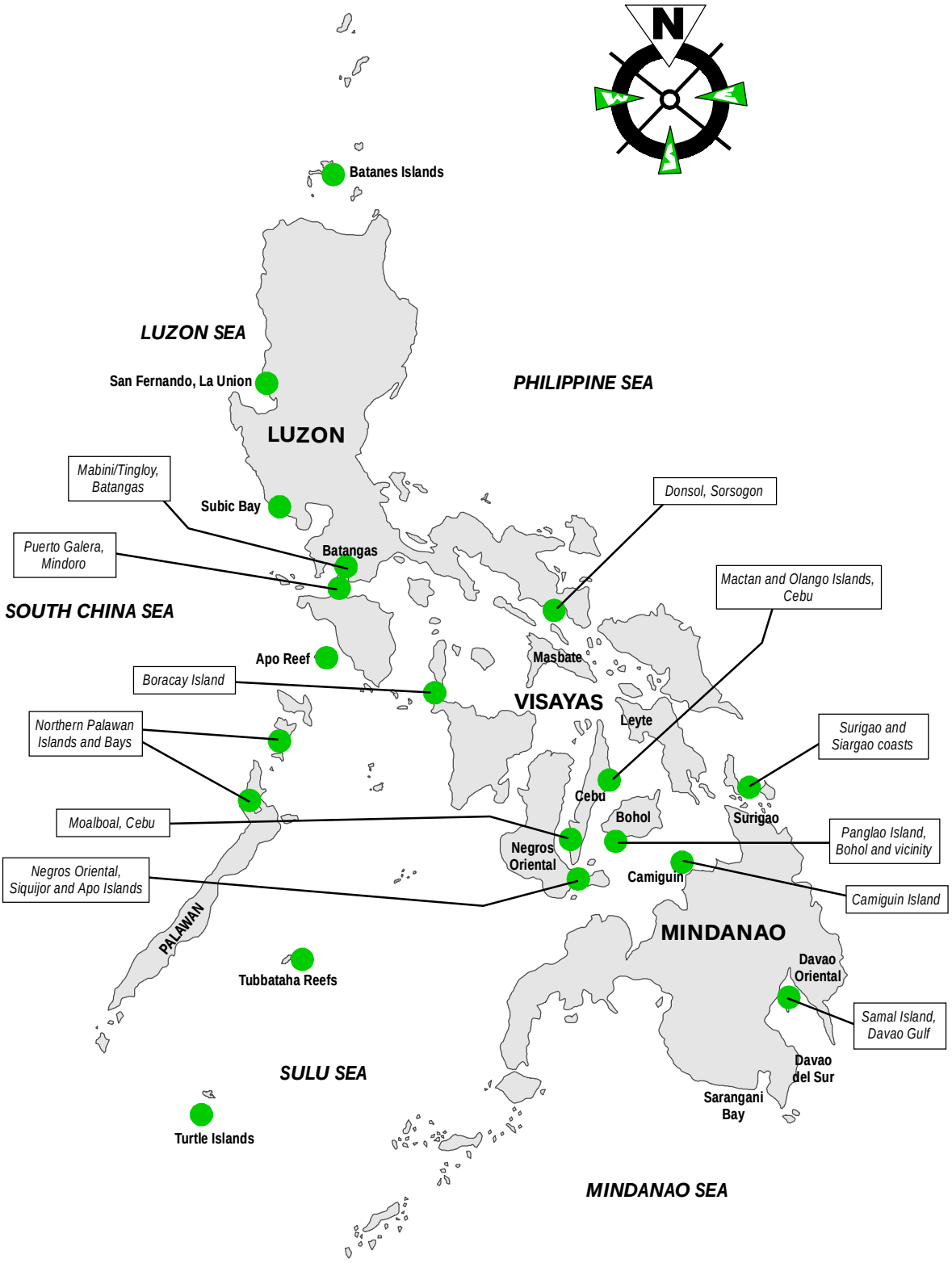
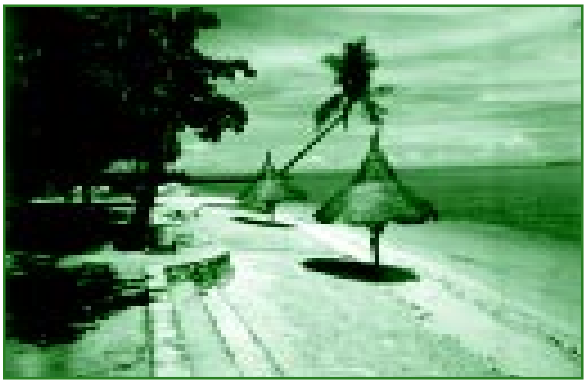


Figure 1: Popular and emerging coastal tourism destinations in the Philippines

Coastal tourism deals with two complex systems—the tourism system and the coastal system. The former is primarily a human system and the latter, an environmental one. Naturally, there are close interactions between these two systems, for instance, the impact of tides, storms, wave action and other natural phenomena on coastal tourism. Of the same importance are the impacts of tourism on the environment and social settings of a coastal system. These include accelerated beach erosion, deteriorating coastal water quality, dumping of solid waste on beaches or in near-beach areas, coral reef degradation through inadequate anchorage and landing facilities, salt-water intrusion, increasing traffic noise and congestion. The list could continue.

Unplanned and unregulated development along the shoreline results in environmental degradation and resource use conflicts.

There are many examples in Asia of severe negative impacts on the environment from coastal tourism. The well-known examples of Pattaya Beach, Thailand and Hikkaduwa, Sri Lanka are indicative of what can happen with over-development without consideration for carrying capacity or the balance between development and nature (Wong 1991, 1993). In the Philippines, development typically consists of small resorts which are somewhat integrated into the local culture and environment. But, even here, most coastal resorts are poorly planned with respect to the protection of those resources, namely coral reefs, nearshore water quality and clean beaches. Larger players such as international resort chains have only recently begun to implement more stringent environmental practices on their properties. There is room for significant improvement of environmental practices on both smaller, integrated resorts and larger, international resorts.



Proper development setbacks on beaches allow for natural cycles of sand movement and storm surge that prevent property damage. Public access can also be maintained in the foreshore area.

The negative impact of coastal tourism development in the Philippines reached the minds of the general public not long ago through media coverage of one near-environmental disaster. In July 1997, the headline: "Boracay Water Unsafe for Bathing" shocked tourists, developers and operators of one of Philippines' most famous resort destinations, once voted the "world's most beautiful beach" (Trousdale 1997). Boracay waters were allegedly unsafe for swimming and other recreational activities due to high levels of coliform bacteria, indicating the presence of other microbes more harmful to human health. These organisms can cause illnesses such as cholera, typhoid fever and skin disorders.

The contamination of Boracay was the result of untreated or insufficiently treated wastewater from the countless small-scale septic tanks seeping into the water table or being flushed directly into the sea via beaches or streams. With its skyrocketing popularity as the major beach destination in the Philippines, the discharge of wastewater had soared to unmanageable levels during peak seasons.

Boracay's tourism industry and the provincial government had to learn the hard way: sensational newspaper headlines almost ruined the local tourism industry. The Philippine Tourism Authority (PTA) is now working on Boracay's water system, aided by the Japan's Overseas Economic Co-operation Fund. The project includes setting up a system to transport fresh water from the mainland to Boracay, as well as the installation of a sewage treatment plant.

If proper planning and effective environmental management practices were in place in Boracay, the risk of losing important coastal tourism business would have been avoided. If proper sewage and solid waste systems are installed, and the coastal environment is protected in these areas, high tourist arrivals can be accommodated, and sustainable economic benefits can be achieved. True, these measures cost money, but it is an investment for the future that protects other higher investments for tourism buildings and infrastructure in the long term.

ROSS

All pollutants generated in the watershed from agriculture, industry, logging and other activities eventually reach the sea through surface water runoff or groundwater movement.

Tourism players should look at smart and appropriate solutions for waste treatment. They must find practical, robust and cost-efficient systems for environmental protection that can be easily operated and maintained.

An associated problem in implementing environmental guidelines for coastal resources is that there is no tax collected for use of coastal resources. Developers generally assume free access and do not charge tourists for access to beaches or nearby coral reefs. Yet, special efforts are almost always required to maintain these resources and their benefits in good condition. Thus, the opportunity cost of access to healthy natural resources is not being recovered through the present tourism economic structure. Charging access fees to beaches is an effective way to finance the conservation of coastal resources (White and Cruz-Trinidad 1998). One example is Port Barton, Palawan, where divers are willing to pay an average of PhP120-150 (US$2-3) per person for marine protection measures (Arquiza 1999). Another is the Gilutongan Marine Sanctuary near Cebu, where a user fee levied for divers and visitors is generating US$300-500 per month to maintain the sanctuary (White *et al.* 2001).

There are examples of small-scale coastal tourism projects that are environmentally sustainable. Various beach resorts encourage coastal conservation activities. Local communities, who benefit from low-impact visitors who want to snorkel, scuba dive or birdwatch, realize the need to protect these resources such as at Olango Island, Cebu or Apo Island, Negros Oriental (White 1988a, 1988b; White *et al.* 2001).

In other cases, larger resorts keep their guests happy by creating man-made enclaves with artificial beaches and lagoons, simulating beautiful, unspoiled coastal environments. These projects may contribute little to direct protection of coastal resources in the specific area. However, positive trends are developing in the Philippines, that link high

volume coastal tourism destinations with satellite ecotourism sites where coastal communities are stakeholders.

A possible model for sustainable coastal tourism may be to concentrate tourists in better-managed large hotels and resorts outside sensitive coastal areas so their impact on resources can be more easily controlled and mitigated. These coastal tourism centers may provide the platform to stage short journeys to coastal protected zones in the vicinity that, if carrying capacities are observed, can provide economic benefits to communities and protect coastal environments. The so-called "off-site residence" of tourists could also be seen as an initial phase in the process of sustainable coastal tourism development.

The number of visitors to the Philippines is quite high and their interest is increasingly oriented toward natural destinations (Figure 2). An opportunity thus exists for the country to build on this trend and use tourism as a means to enhance coastal and marine conservation through revenues generated and through the values of tourists who like "clean and green" experiences in their travels.

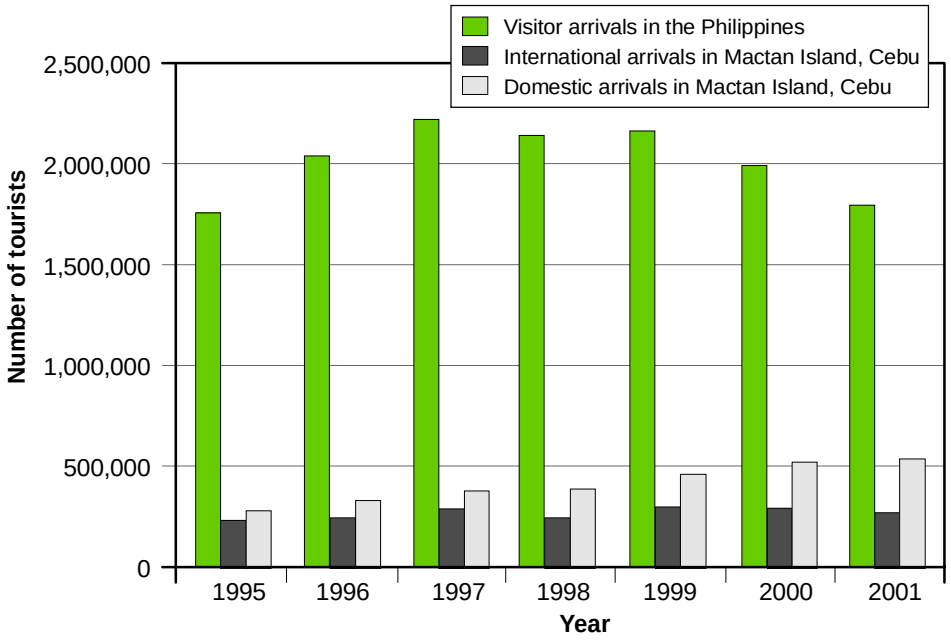


Figure 2: Trends in tourist arrivals from 1995 to 2001 for the Philippines and Cebu

Philippine Coasts and Resources at Stake

The Philippines has a diverse coastal environment with a variety of ecosystems and an extremely rich biodiversity and productivity. Sandy beaches, coral reefs, rocky headlands, mangroves, wetlands, estuaries, lagoons and seagrasses are typical. Each ecosystem plays a critical role in maintaining the health of the coastal zone as well as in maintaining the health of each other. This interdependence makes the coastal zone one

of the most sensitive geographic areas. Damage to a coral reef, for example, will allow greater wave action on shore, causing beach loss. Alteration of one feature of the coastal zone usually causes damage to another feature, either directly or indirectly (Figure 3). A detailed analysis of the Philippine coastal ecosystems is presented in *Philippine Coastal Management Guidebook Series No. 5: Managing Coastal Habitats and Marine Protected Areas* (DENR *et al.* 2001) and in *Philippine Coral Reefs: A Natural History Guide* (White 2001).

Beaches are a prime attraction for coastal tourists and must remain clean and open.

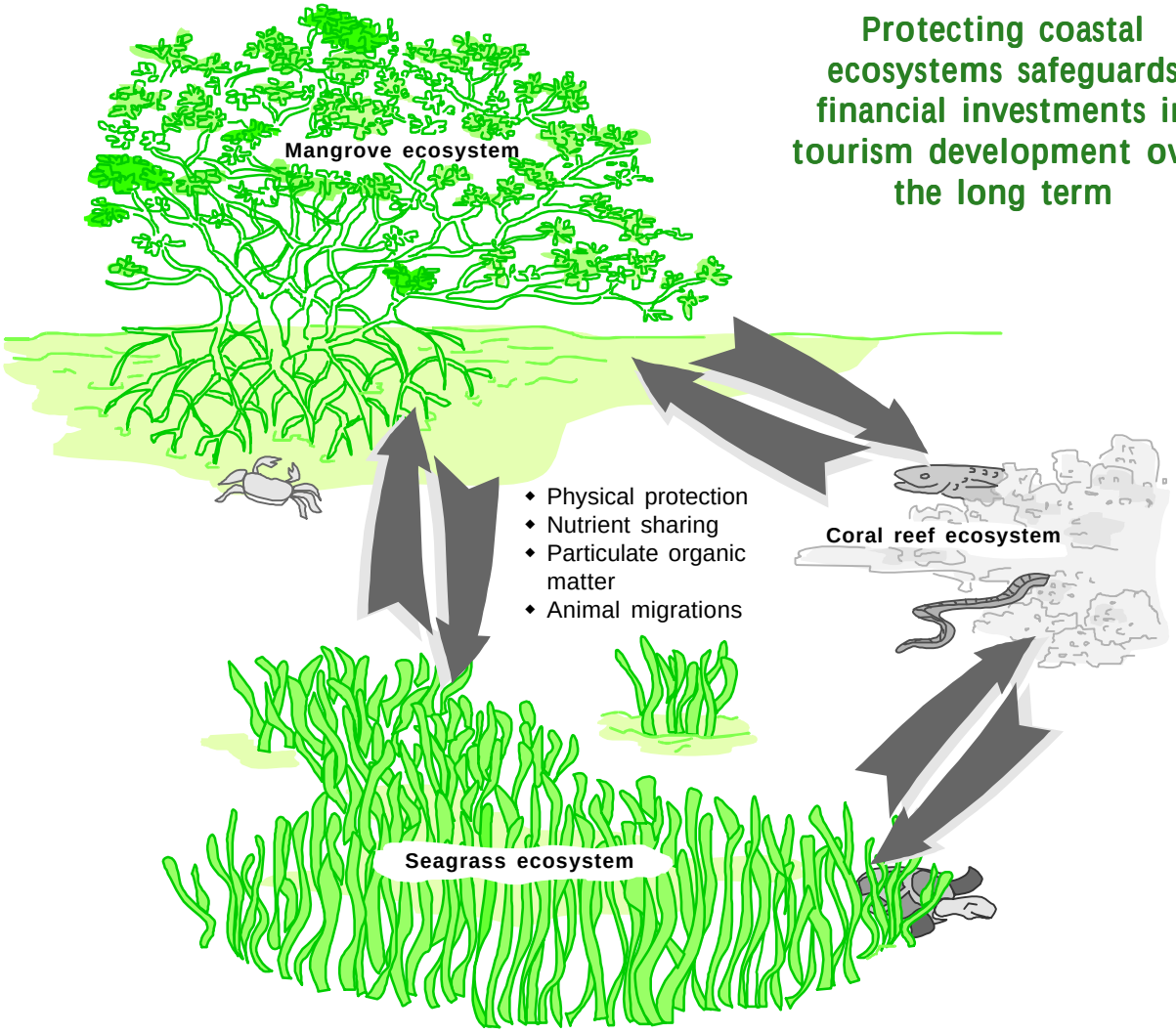


Figure 3: Mutual contributions of tropical coastal habitats (Sullivan *et al.* 1995)

Maintenance of coastal ecosystems is important in sustaining the tourism industry. When the ecosystems are damaged or lost, tourism will decline as shown in Figure 4. This happens as the local "carrying capacity" of the environment is surpassed by numbers of tourists and other types of development activities.

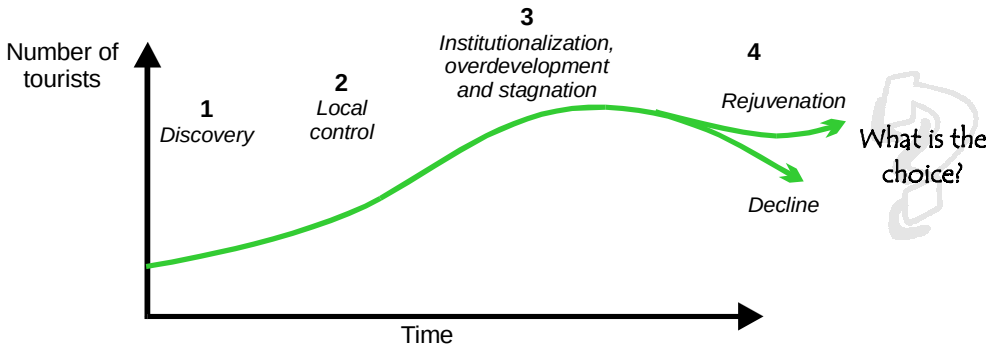


Figure 4: Tourist area life cycle with four stages of development (Butler 1980)

Beaches are the focal point of coastal tourism since many tourist activities depend on clean beaches. Beaches are dynamic, unstable systems, which are constantly subject to the forces of erosion, the removal of sand; and accretion, the deposition of sand. Many beaches are part of eroding systems, causing economic losses to property owners and to the tourism sector. Beach loss from human activities, sometimes tourism related, is generally caused by:

- Sand and coral mining in coastal areas (e.g. from dredging of boat channels, and mining of sand for construction or beach replenishment);
- Building structures which inhibit long shore sediment transport (Figure 5); and
- Construction of groins and seawalls that adversely affect adjacent coastal areas (Figure 6).

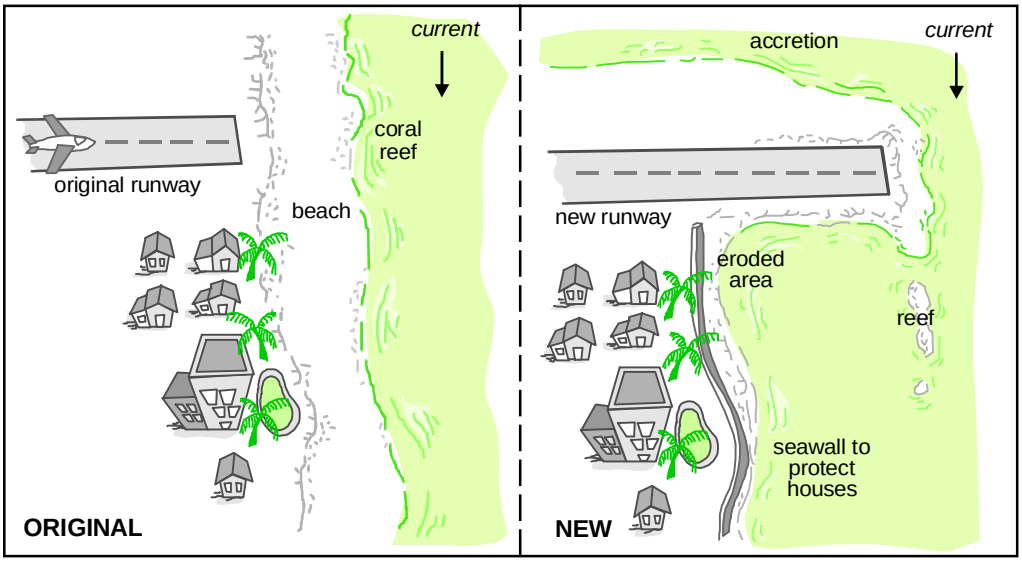


Figure 5: Extension of airport runway interferes with sand movement, Dumaguete City (DENR *et al.* 2001)

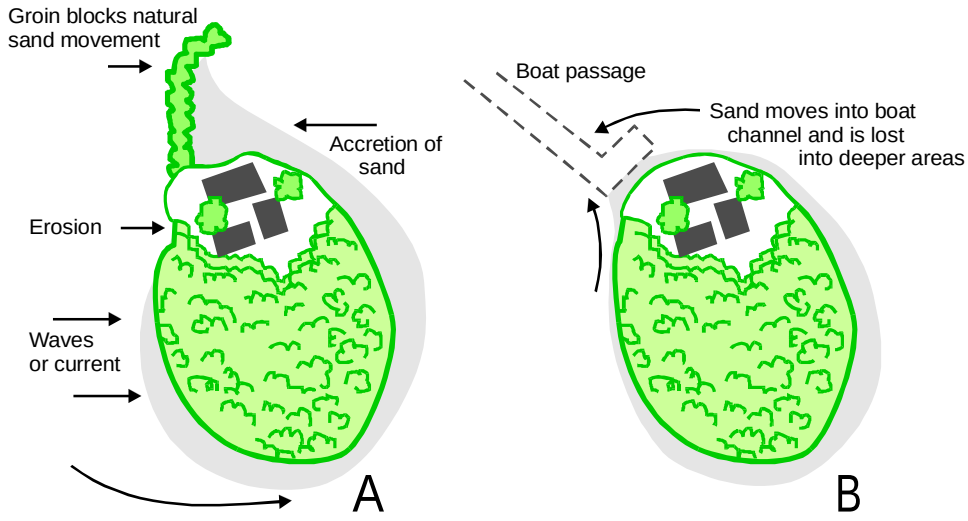


Figure 6: Examples of beach erosion caused by the construction of a groin (A) or a boat passage (B). A shows the distribution of sand and the site of erosion caused by the construction of a groin. In **B** the arrows indicate the movement of sand into a trap created by the construction of a boat passage (Wong 1991)

Coral reefs are valuable tourism assets that attract many tourists for snorkeling and scuba diving. Healthy reefs are important ecologically and economically. Potentially damaging tourism-related activities of coastal development on coral reefs include:

- Increased siltation and sedimentation from dredging, filling or coastal construction;
- Pollutants and excess nutrients from waste disposal and sewage discharge;
- Discharge of large volumes of freshwater from stormwater drains, increased surface runoff from surface paving or vegetation removal;
- Overfishing and blast fishing to provide fish for local tourist restaurants; and
- Coral breakage from guests exploring the reef, anchor damage or collection of organisms for sale or souvenirs or for recreation such as by spear fishing.

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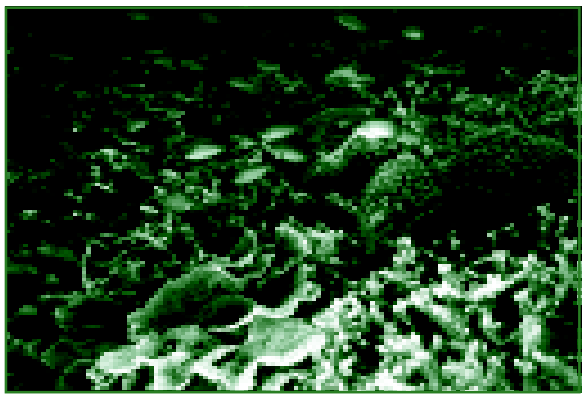


Healthy coral reefs in the Philippines have high biodiversity, support many species that benefit humans and attract tourists.

Coastal wetlands, which include seagrass beds, lagoons, mudflats, estuaries and mangroves, are important to tourism at two levels. They remove pollutants from water flows before they enter the main water bodies. This function protects beaches and coral reefs and coastal water quality—the most important coastal tourism assets. Second, wetlands can provide direct benefits such as settings for birdwatching and nature photography, canoeing and other water sports. Ecologically, wetlands and mangroves provide spawning and nursery habitat for juvenile fish, crustaceans and mollusks or habitats for migratory and resident birds among other terrestrial wildlife (Figure 7).

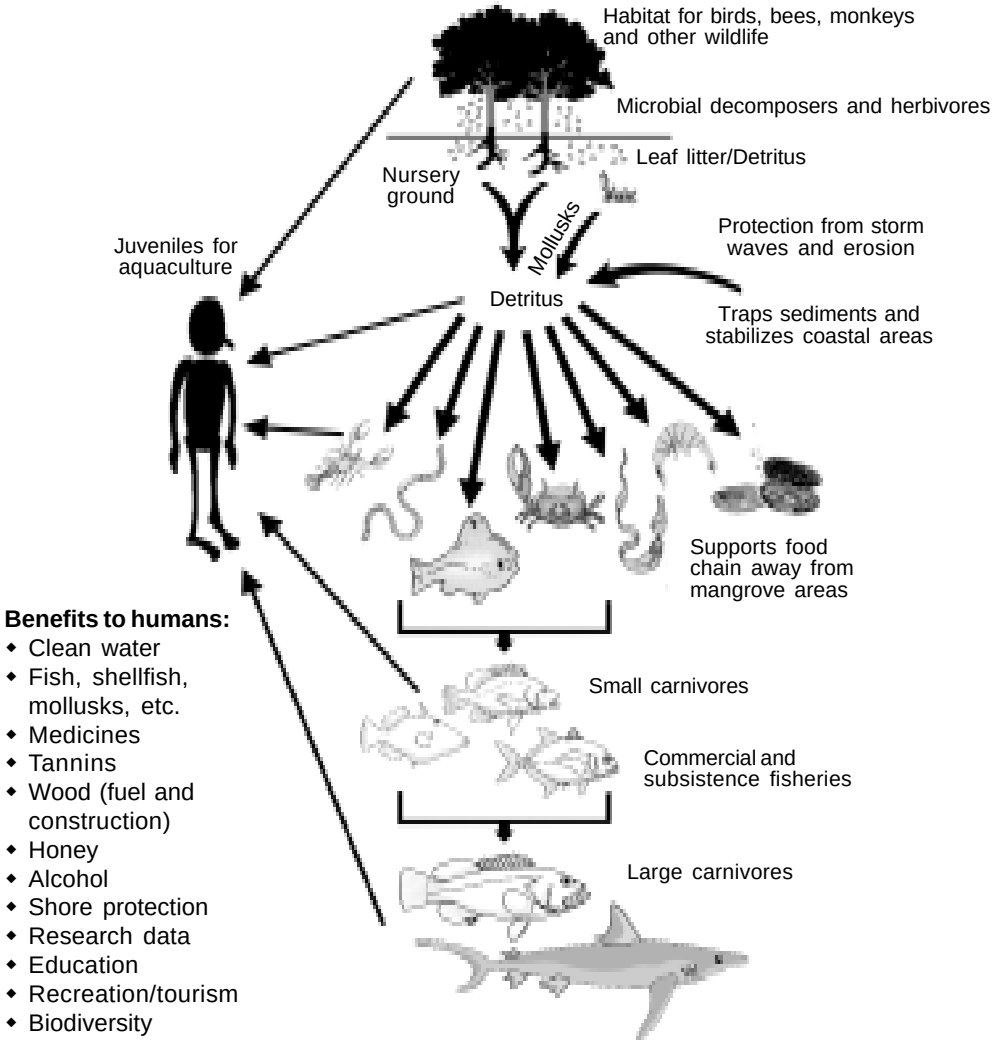


Figure 7: Mangroves and their ecological and economic benefits (Berjak *et al.* 1977)

Human activities that impinge on wetlands are many, those related to tourism are:

- Removal of mangrove habitat for resort construction;
- Disposal of sewage and solid waste into wetlands; and
- Construction of obstructions to the natural water movement within or between wetland water bodies.

Ecosystem linkages and the impacts of tourism

The above ecosystems combined form the coastal environment. These ecosystems are connected to one another via several mechanisms including tides, currents, waves, nutrients, the hydrologic cycle and sedimentation (Figures 3 and 8). It is important when designing a development project to understand these mechanisms and to predict how the development project will affect these processes. Disruptions in these processes can lead to severe environmental damage (Maragos *et al.* 1983). The potential impacts on coastal ecosystems of various tourist development activities are summarized in Table 1.

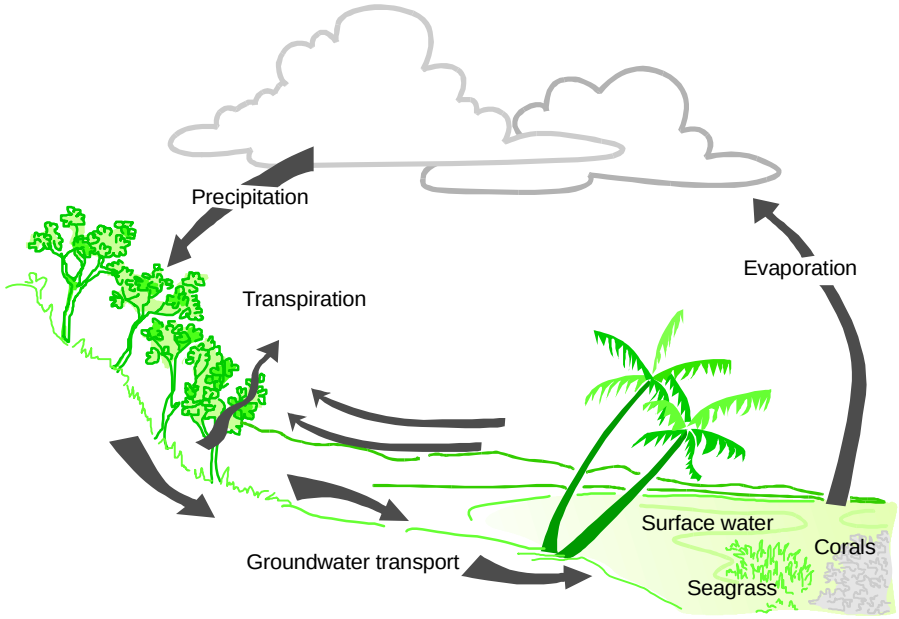


Figure 8: The hydrologic cycle (Rees 1990)

Table 1. Potential environmental impacts from coastal tourist development activities

Coastal habitats	Environmental impacts	Tourist development activities which may cause these impacts
Coral reefs	• Physical damage to coral reefs and collection of reef organisms beyond sustainable limits • Increase in freshwater runoff and sediments • Introduction of waterborne pollutants	• Reefwalking, collection of souvenirs from reef, overfishing to supply restaurants • Land clearing for construction • Freshwater influx from wastewater pipes from poorly treated sewage and improper disposal methods
Estuaries/ lagoons	• Encroachment • Changes in sedimentation patterns • Changes to the salinity regime • Introduction of waterborne pollutants • Destruction of submerged and fringing vegetation • Inlet modifications • Loss of fishery habitat	• Land-filling for siting of structure • Placement of structures on beach/in coastal waters • Freshwater runoff • From runoff, sedimentation, recreational uses • For harbor maintenance, siting considerations • From land-use modifications, increased runoff, sedimentation; pollution increases from sewage, wastewater disposal

(continued)

Table 1. (continued)

Coastal habitats	Environmental impacts	Tourist development activities which may cause these impacts
Mangroves	• Changes in freshwater runoff, salinity regime and tidal flow patterns • Excessive siltation • Introduction of pollutants • Conversion of mangrove habitat and overharvesting of resources	• (see coral reefs, estuaries/lagoons) • From construction activities, wastewater discharges sewage • For use as a tourist development site
Seagrass beds	• Physical alterations • Excessive sedimentation or siltation • Introduction of excessive nutrients or pesticides	• By boat anchoring, recreational activities, increased runoff (see above) • Sewage, wastewater discharge
Salt marshes (tidal flats)	• Degradation of bird habitat or seed fish collection sites • Obstruction of stormwater runoff	• From discharging wastes, physical alteration for tourist uses • From altering tidal flats for development purposes
Barrier beaches, sand dunes and spits	• Sand mining • Erosion • Dune migration	• For construction purposes • From disregarding setback regulations, improper placement of coastal structures • Removal of natural vegetation

Adapted from CCD (1997)

Summary

The coastal ecosystems common to the Philippines and their linkages must be considered in planning for development. Those ecosystems of concern include coral reefs, mangroves, estuaries and beaches together with the marine waters that are essential to all marine ecosystems. Natural beach erosion processes and sand transport dictate building setback requirements and the need to maintain natural beach vegetation. Marine and fresh water quality maintenance is determined by the type and impact of coastal facilities and their waste treatment process. Aesthetically pleasing coastal features such as coral reefs, vegetation, clean beaches and water attract tourists while disturbed and polluted systems repel tourists. Thus, careful maintenance and enhancement of the coastal system is the only sustainable path for tourism development.

CHAPTER 2

Integrated Coastal Management: Context for Tourism Planning

The best plans are no guarantee for stopping environmental degradation, but without them there is no hope!

The development of tourism in coastal areas occurs in the context of the coastal environment and its ecosystems described in Chapter 1. The coastal area has many complexities that must be considered for any kind of development, whether it is tourism related or not. This chapter provides an introduction to integrated coastal management (ICM) as the overall approach to address the issues created by development in coastal areas. ICM is a means of planning for resource management and coastal development and implementing these plans. ICM considers the interaction among and within human development activities and the natural coastal environment. It provides a systematic way to analyze the coastal situation and to plan for its development before mitigation and restoration are required. It helps prioritize the outcomes that people value most through a participatory process whereby all key stakeholders have a role in the decision process in planning the development of their area.

The widespread decline of coastal resources in the Philippines is, without a doubt, a fundamental and urgent issue that needs to be addressed through active involvement from all sectors of society. The uncontrolled exploitation of natural resources has served as the primary starting point for the degraded condition of coastal resources experienced today. Tourism only stands to lose from this deteriorating scenario.

Regular and appropriate investments in coastal management are required to sustain national and local benefits derived from coastal resources. Furthermore, with the recognition that effective management develops from a participatory process involving coastal stakeholders and day-to-day resource users, many countries, including the Philippines, have devolved the responsibility of managing coastal resources to the

lowest level of government. Herein lie the challenges and opportunities to transform these and other new paradigms in coastal management to the successful recovery of Philippine seas. Changes in the overall orientation of coastal management in the Philippines are described in Table 2.

Table 2. New paradigms for coastal management in the Philippines

- Shift in emphasis to coastal protection and management from fisheries development, exportation and optimum production;
- Devolution of responsibility and mandate for managing municipal waters to local government;
- Redefining roles of national government agencies (NGAs) toward assisting local government with coastal management;
- Establishing multisectoral and inter-LGU agreements to solve complex problems associated with coastal management;
- Broadening the base of local and national support to sustain community-based coastal resource management (CRM) (Christie *et al.* 1994; White *et al.* 1994); and
- Mainstreaming coastal management on the national agenda.

Proven Approaches and Policies for Coastal Management

The Philippines is in the process of defining what policies are basic to successful ICM. These are being tested at the field level all around the country and are being compared to national law and institutional structures in an effort to improve the connections between local implementation and national policy. Several key ingredients in the national policy framework that reflect local realities in the Philippines are:

- **Participation in management decisions is essential at all levels**. The Philippines has a tradition of democracy that encourages community-level participation and responsibility. This builds on the bottom-up model of encouraging *barangay*-level groups to form management associations and become the effective managers of their coastal resources. This local level of decision-making is supported through the Local Government Code and the Fisheries Code, which both give significant jurisdiction to local governments in the resource management process.

- **National agencies with jurisdiction over coastal resources need to assist LGUs and provide technical support**. The capacity of local governments to manage their coastal environments and resources is limited. They need technical guidance, personnel, budget and mentoring to achieve ICM practices. This can be facilitated by national agencies such as the Department of Agriculture-Bureau of Fisheries and Aquatic Resources (DA-BFAR), Department of Environment and Natural Resources (DENR), Department of the Interior and Local Government (DILG), and Department of Tourism (DOT) with

jurisdiction and concern for coastal environments and resources. The difference now, as compared to the past, is that the direct management responsibility and implementing authority lies primarily with the local governments.

- **Collaboration and synergy among agencies is essential**. The very term "integrated" strongly suggests that all institutions with a mandate and concern for management of coastal resources must collaborate. This collaboration will include government and nongovernment organizations (NGOs) and international projects and donors. The planning unit and the boundaries of collaboration will most often be determined by ecological criteria and natural divisions. Bays with defined ocean parameters, resources and issues do not respect political boundaries. Rather, they must be planned for and managed as a bay unit. This may include several municipalities and one or more provinces in some cases.

- **Multiple education and communication strategies are required to build a wide base of support for ICM**. People must begin to understand the issues before they will take action to solve them. This can be achieved through education and media campaigns. ICM can be promoted through networks of constituency groups to support initiatives, thus ensuring better sustainability of efforts.

- **Proven technical interventions must be pursued and applied appropriately**. Much experience has been gained through a variety of coastal management projects that have tested coastal management interventions. The viable interventions must be pursued, such as integrated planning, habitat protection and management, improved law enforcement, environmentally sensitive livelihood options, community organization and education, and others (Christie and White 1997).

Local government plays a pivotal role as the last safety net for the recovery of coastal and marine resources in the Philippines. For this reason, the *Philippine Coastal Management Guidebook Series* (DENR *et al.* 2001) highlights coastal management processes and management measures that are collectively viewed as the delivery of basic services by local governments — municipal, city and provincial. These basic services cannot be delivered without cooperation between local governments and, at the same time, without the support of NGAs, NGOs, coastal communities, academe, private and other sectors.

National Legal and Policy Framework for Coastal Management

The primary mandate for coastal management has been largely devolved to local government under the Local Government Code of 1991 (Republic Act No. 7160) and more recently defined in the Fisheries Code of 1998 (Republic Act No. 8550).

Coastal management may be viewed as one of the inherent functions of LGUs in accordance with their general powers for management within their territorial jurisdictions which include municipal waters out to a distance of 15 km from the coastline (Table 3). Protected areas declared under the National Integrated Protected Areas System (NIPAS) Act of 1992 are managed by a locally constituted Protected Area Management Board (PAMB) which also provides a major role for LGU participation. The full national policy framework for coastal management is described in *Guidebook 2: Legal and Jurisdictional Framework for Coastal Management* (DENR *et al.* 2001).

Table 3. Granting of jurisdiction over municipal waters as defined in the Fisheries Code

Section 16, Article I. Jurisdiction of Municipal/City Governments. The municipality/city government shall have jurisdiction over municipal waters as defined in this Code (…marine waters included between two lines drawn perpendicular to the general coastline from points where the boundary lines of the municipality touch the sea at low tide and a third line parallel with the general coastline including offshore islands and fifteen kilometers from such coastline). The municipal/city government, in consultation with the Fisheries and Aquatic Resources Management Council (FARMC) shall be responsible for the management, conservation, development, protection, utilization and disposition of all fish and fishery/aquatic resources within their respective municipal waters.

Section 76, Article II. The integrated Fisheries and Aquatic Resources Management Councils shall be created in bays, gulfs, … [bounded by two or more municipalities/cities to assist in the preparation of plans, fishery ordinances, enforcement of fishery laws, provide advice on fishery matters and perform other functions as required.]

Coastal Management as a Basic Service of Local Government

Coastal management as a basic service of local government incorporates all the local government powers and responsibilities including planning, protection, legislation, regulation, revenue generation, enforcement, intergovernmental relations, relations with people's and nongovernment organizations (NGOs), and extension and technical assistance. The process shown in Figure 10 has been detailed from the perspective of local government, in particular, municipalities and cities, which are now tasked by law with the primary responsibility for the nation's coastal resources and municipal waters. This planning process for local government is tailored from a more generic process evolving in many parts of the world for coastal management (see Figure 9).

The steps in the coastal management planning process adapted for local governments shown in Figure 10 are basic and essential prerequisites to successful CRM. These steps can all be facilitated and partially supported by local governments together with their partner communities at the *barangay* level as well as NGAs. A brief description of each phase in the process highlighting LGU basic services and the role of other sectors is shown in Table 4.

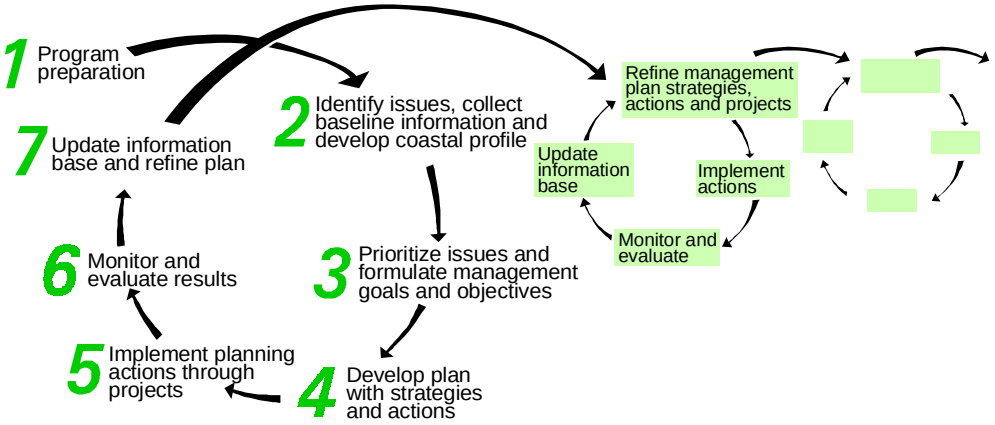


Figure 9: Cyclical integrated coastal management data collection, planning, implementation and monitoring process (White 1997)

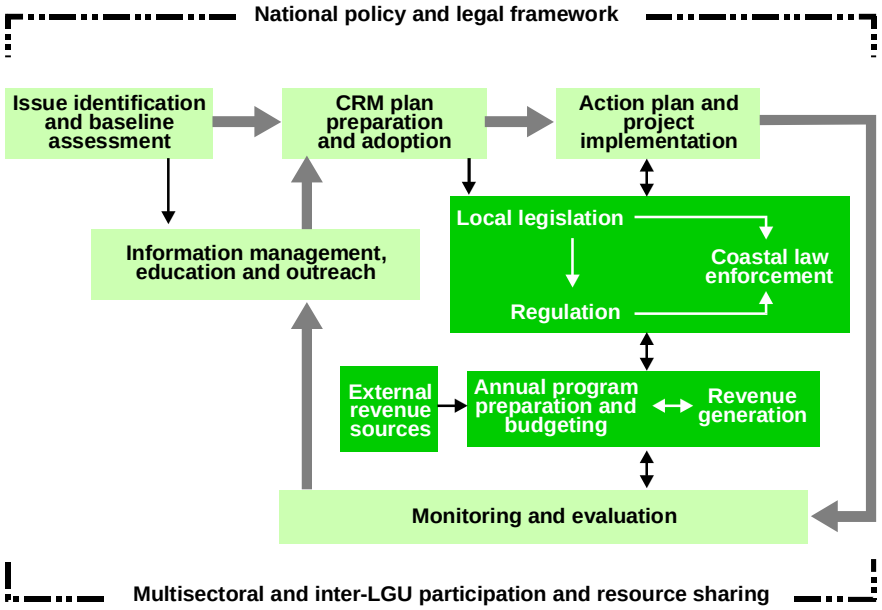


Figure 10: The coastal management planning process being adapted for Philippine local government

The municipal or city government has an important facilitating role in the coastal management process because of their legal mandate to manage resources within municipal waters. National agencies, DENR and BFAR primarily, have key supporting roles in the coastal management process together with LGUs, including provinces. NGOs, both national and local, are often involved in the community-level implementation process through either contracting arrangements under government agencies or through their own projects funded externally.

Table 4. Coastal management phases and steps as a basic local government service and the roles of various sectors

Phases and steps	Activities and outputs	Roles of local municipal or city government, community and stakeholders	Technical assistance roles of national and provincial government, non-government organizations, academe and donors
PHASE 1: Issue identification and baseline assessment			
a. Program preparation	• Allocate budget • Determine boundaries and scope • Make workplans/ budgets • Assign personnel • Secure consensus on overall approach	• Source funding for CRM planning activities • Annual investment plan for CRM • Enter into memo-randa of agreement • Participate in discussion • Communicate needs and potential roles • Agree on design	• Prepare workplans • Formulate working agreements • Contract and train staff • Facilitate consensus on design
b. Secondary information gathering	• Compile existing maps, reports, data • Interview information sources • Compile existing laws, plans • Review other sources of information	• Provide information • Assist in compiling information • Begin to develop information storage and retrieval system	• Locate sources of information • Compile information in useful form • Coordinate activities
c. Field assessment/ Participatory Coastal Resource Assessment (PCRA) and other research	• Train practitioners • Conduct PCRA mapping and data collection • Contract special research studies on fish stock assessment, habitat condition, water quality, enterprise and others	• Conduct PCRA with technical assistance • Participate in special research and data collection • Assist in data analysis • Provide inputs to mapping	• Train practitioners • Facilitate PCRA • Conduct specialized research • Analyze research data • Make results available
d. Database and profile development	• Maps completed • Set up data storage and retrieval system • Compile coastal environmental profile • Use profile as planning base • Refine boundaries and further research needs	• Provide information • Assist with profile analysis • Validate data • Use profile for planning • Decide on boundary demarcation • Present profile to legislative bodies	• Determine data storage site, personnel • Write profile • Distribute profile • Facilitate discussions on boundaries and research needs

(continued)

Table 4. (continued)

Phases and steps	Activities and outputs	Roles of local municipal or city government, community and stakeholders	Technical assistance roles of national and provincial government, non-government organizations, academe and donors
e. Prioritize issues and analyze causes	• Conduct community and municipal-based planning sessions • Develop issue tree • Prioritize issues for management	• Participate in process and provide major input • Participate in conflict resolution • Set priorities in real terms	• Facilitate process • Interject outside perspectives, research findings, policies, etc. • Help translate issues into causes
PHASE 2: CRM plan preparation and adoption			
a. Establish management bodies	• *Barangay* and municipal FARMCs established and active • Multisectoral Technical Working Group established	• Advisory body to LGU • Provide basic policies • Provide major inputs to plan	• Facilitate planning process • Conduct planning workshops • Provide technical guidance • Assist to set up management bodies
b. Define goals and objectives	• Conduct CRM planning workshop • Identify and evaluate management options • Management strategies and actions identified	• Build consensus among community • LGU support to planning process	
c. Develop CRM strategies and action plan	• Proposed water use zones delineated and mapped • Multi-year management plan drafted • Community consultations on draft management plan conducted • Proposed CRM plan presented in multisectoral forum • Multi-year CRM plan finalized and adopted	• LGU and community participation in planning process • Present plan to concerned legislative bodies for adoption and support	• Facilitate inter-agency coordination

(continued)

Table 4. (continued)

Phases and steps	Activities and outputs	Roles of local municipal or city government, community and stakeholders	Technical assistance roles of national and provincial government, non-government organizations, academe and donors
PHASE 3: Action plan and project implementation			
a. CRM plan implementation	• Establish and staff municipal CRM office • Action plans developed for CRM plan implementation • Secure support as required • Increase implementation effort • Marine sanctuaries established and functional • Environment-friendly enterprises established • Mangrove areas rehabilitated and managed under Community-based Forest Management Agreement (CBFMA) • Registry of municipal fishers established	• Take full responsibility • Participate in implementation • Provide local personnel • Organize community groups to assist with implementation • Enter stakeholder agreements • Source funding	• Facilitate initial implementation • Provide seed funding • Provide technical guidance • Conduct training course as required
b. Legislation and regulation	• Ordinances enacted for CRM plan and implementation • Permits and licenses issued for municipal water uses consistent with CRM plan	• Participate in decision process • Endorse and implement	• Assist to draft • Provide information with examples
c. Law enforcement	• Coastal law enforcement units trained and operational • Ordinances enforced	• Participate and support • Deputize and organize fish wardens	• Technical training • Assist in coordination
d. Revenue generation	• Taxes, fines and fees collected from enterprise development, coastal law enforcement and municipal water use	• Establish regular collection system • Use revenue for CRM	• Provide examples and technical assistance

(continued)

Table 4. (continued)

Phases and steps	Activities and outputs	Roles of local municipal or city government, community and stakeholders	Technical assistance roles of national and provincial government, non-government organizations, academe and donors
e. Annual program preparation and budgeting	• Review implement-ation progress of CRM plan • Annual Investment Plan prepared and budget allocated for CRM • Staffing requirements identified • Operation and maintenance needs identified • Capital outlay requirements identified • Special projects identified	• Conduct public review • Develop Annual Investment Plan for CRM • Allocate budget • Commit staff	• Technical assistance as appropriate • Policy guidance • Source funds
PHASE 4: Monitoring and evaluation			
a. Monitoring and evaluation	• Training, technical assistance and out-reach needs identified • Train monitoring and evaluation team • Monitor environment and ICM process and feedback to database and plan • Performance evaluations conducted • Management capacity assessments conducted • Outcome evaluations conducted • Annual monitoring and evaluation report prepared	• Collect data • Participate in process • Take responsibility	• Assist to train LGU personnel • Assist to analyze data • Assist to set up sustainable system
b. Refine management plan	• Annual CRM plan review and revision	• Use data to refine plan and update database	• Provide input on plan refinement

(continued)

Table 4. (continued)

Phases and steps	Activities and outputs	Roles of local municipal or city government, community and stakeholders	Technical assistance roles of national and provincial government, non-government organizations, academe and donors
PHASE 5: Information management, education and outreach			
a. Information management	• Establish and update municipal coastal database • Produce and update municipal water use and coastal habitat maps • Annual CRM status reports and maps produced • Information management system functioning and institutionalized	• Process data into useful information	• Design information system • Maintain provincial and national coastal databases • Provide training
b. Information, education, and communication	• Information disseminated for education and planning • Technical assistance and outreach program established • Conduct education campaigns for municipal CRM programs • Hold public hearings for proposed CRM plans and ordinances	• Disseminate and use information • Feedback to plan • Disseminate municipal report on status of coastal resource management	• Assist with information and education materials development • Prepare and disseminate provincial and national reports on the status of coastal resource management

Source: Modified from White (1997)

Academic institutions of different types have important roles in baseline assessment, information management and analysis for planning, and monitoring and evaluation of coastal management. Overall, the coastal management process is one of collaboration among various sectors and stakeholders. The various roles are elaborated in Table 5.

Table 5. Specific roles of government and nongovernment groups in coastal management

Local government units (Municipality and City)

- Provide overall facilitation and coordination for planning and implementation
- Develop a coastal environmental profile with maps for planning
- Conduct information, education and communication (IEC) and training activities for local oranizations
- Develop and adopt 5-year CRM plan
- Support CRM plan implementation through appropriate ordinances
- Incorporate appropriate CRM best practices in plan
- Implement CRM plans through Annual Investment Plan and budget
- Enact comprehensive fisheries management ordinance
- Maintain a municipal coastal database to facilitate planning and implementation
- Support participatory coastal resource assessments for each *barangay*
- Provide budget and dedicated personnel for planning and implementation
- Identify and implement alternative or supplemental livelihood for coastal communities
- Support coastal law enforcement units as required
- Contract assistance through consultants and NGOs
- Support organization and mandate of municipal and *barangay* FARMCs
- Monitor field activities and selected biophysical and socioeconomic indicators
- Implement revenue generation mechanisms through licenses, fees and taxes
- Network and collaborate with local and international funding institutions for program/ project implementation
- Conduct IEC campaigns related to sustainable use of coastal resources
- Conduct site-specific research
- Collaborate with province, other municipalities or cities and national agencies to develop multi-municipal ICM plans as required for special management areas

Local government units (Provincial)

- Develop and implement policy and planning framework for CRM in province
- Provide technical assistance to municipalities and cities for coastal management planning and implementation
- Monitor and evaluate all coastal management activities and results in province
- Establish and maintain a training staff to train LGUs and other stakeholders in CRM
- Assist to coordinate law enforcement for multi-municipal areas
- Establish, maintain and update an information management system and database
- Assist each municipality and city to establish and maintain a municipal coastal database
- Provide financial incentives for coastal management based on results of monitoring
- Assist the national government in developing and implementing policy and planning framework for CRM in the country

Community stakeholders and people's organizations (POs)

- Participate in all CRM planning sessions in all levels of local government (*barangay*/ municipality/city/province)
- Provide members to *barangay* and municipal FARMCs
- Participate in stakeholder management organizations
- Volunteer for coastal management implementation activities (i.e. law enforcement, fisheries monitoring and sanctuary establishment and management, etc.)
- Provide local and traditional knowledge and experience in resource management
- Initiate IEC activities in the community
- Source funds for community projects

(continued)

Table 5. (continued)

Local government units (*barangay*)

- Data gathering and profiling
- Collaborative planning, implementation and gathering of information
- Participation in FARMC, *Bantay Dagat* and other organizations
- Formulation of resolutions on CRM and enterprise for submission to municipality

Department of Environment and Natural Resources (DENR)

- Formulate in coordination with BFAR, a national strategic framework for CRM
- Assist with management of resources and areas under the mandate of DENR (e.g. mangroves, water quality, foreshore management, quarrying and protected areas)
- Provide material input assistance in specific projects under DENR's mandate
- Provide technical guidance to LGUs in coastal management planning and implementation
- Assist in training of LGUs and community stakeholders
- Identify and implement alternative or supplemental livelihood for coastal communities
- Coordinate with BFAR in the sustainable management of coastal and marine resources
- Monitor and evaluate progress in achieving goals and objectives for coastal and marine resources in the Medium Term Program Development Plan

Bureau of Fisheries and Aquatic Resources (BFAR)

- Formulate a national fisheries management plan as a component of a national strategic framework for CRM
- Assist with management of resources and areas under the mandate of BFAR (e.g. fisheries of all kinds, fishing techniques, stock assessment and aquaculture)
- Provide material input assistance in specific projects under BFAR's mandate
- Provide technical guidance in coastal management planning and implementation
- Assist in training of LGUs and community stakeholders
- Assist in fishery enforcement
- Coordinate with DENR in the sustainable management of coastal and marine resources
- Monitor and evaluate progress in achieving goals and objectives for coastal and marine resources in the Medium Term Program Development Plan

Department of the Interior and Local Government (DILG)

- Provide technical guidance and training to LGUs in enhancing the delivery of CRM as a basic service
- Provide operational coastal law enforcement units under the Philippine National Police (PNP) Maritime Group
- Provide financial assistance in specific projects under DILG's mandate
- Monitor and evaluate progress in achieving the goals and objectives for coastal and marine resources in the Medium Term Program Development Plan

Department of Science and Technology (DOST)

- Monitor aquatic and marine research and development projects
- Formulate strategies, policies, plans, programs and projects for aquatic and marine science technology
- Generate external funds

Department of Tourism (DOT)

- Undertake tourism planning
- Promote and assist tourism
- Establish policies and guidelines for tourism development
- Assist tourism development to comply with Philippine laws and norms

(continued)

Table 5. (continued)

Department of Transportation and Communication (DOTC)

- Formulate policies, plans and regulations involving maritime transportation through the Maritime Industry Authority (MARINA)
- Develop ports and harbors through the Philippine Ports Authority (PPA)
- Assist in the implementation of laws in the high seas and waters of the Philippines; safeguard marine resources and the environment; prevent, mitigate and control marine pollution through the Philippine Coast Guard (PCG)

Philippine Council for Aquatic and Marine Research and Development (PCAMRD)

- Coordinate, plan, monitor and evaluate research development activities dealing with the country's aquatic resources
- Facilitate and program the allocation of government funds earmarked for fisheries and aquatic resources research and development, including coastal management initiatives of academic institutions
- Generate resource-based information for the management of the country's marine resources
- Act as the government lead agency in the implementation of the National Course on Integrated Coastal Management and the training program on ICM for LGUs
- Maintain the National Aquatic Resources Research and Development System and the PhilReefs, the information network on coral reefs and related ecosystems

Nongovernment organizations

- Provide assistance at the community and *barangay* level to organize FARMCs and other resource management organizations
- Provide technical services to LGUs for implementing community level interventions
- Provide information and education services at the community and municipal level
- Provide legal services for environmental and fisheries law enforcement
- Assist in monitoring of biophysical and socioeconomic indicators
- Provide a conduit for financial assistance to LGUs for coastal management

Academic institutions

- Assist in analyzing information for coastal environmental profiles
- Assist in designing and implementing a monitoring program for biophysical, socioeconomic and legal-institutional indicators in CRM for LGUs
- Assist in integrating existing data and information into ICM plans
- Assist in formulating CRM plans and packaging of project proposals
- Assist in designing and maintaining a management information system and database for coastal management
- Assist in designing coastal management projects for multi-municipal management areas
- Assist in training LGUs and communities
- Assist in designing IEC and community development programs and strategies for LGUs, NGOs and POs

Donors (national and international)

- Provide financial assistance to national and local governments for CRM projects
- Provide financial assistance for building sustainability in CRM through technical assistance in program design, policy planning and implementation, training, education, monitoring and other aspects of coastal management programs
- Assist in coordinating multisectoral collaboration and policy support for CRM
- Provide international experience in coastal management policy and implementation

Source: DENR *et al.* 2001 (Book No. 1)

Essential Support Processes and Strategies in Coastal Management

Best practices in coastal management can be defined in terms of processes that involve direct community participation and management measures. The overall purpose of developing good coastal management plans is to support the implementation of best practices that are effective in protecting and managing coastal resources and are sustainable (Figure 11). The most important support processes and strategies in coastal management are briefly described below.

- **Local government primary support mechanisms**
  a. Budget allocated for CRM planning and implementation
  b. Staff capability for CRM strengthened through training
  c. Legal support provided for CRM plans through ordinances and resolutions
  d. CRM unit set up with dedicated staff for CRM planning and implementation
  e. Contracts to NGOs, POs or individuals to support CRM activities signed
- **Environmental baseline assessment and profiling undertaken**
  a. Participatory coastal resource assessments and maps completed and used for planning

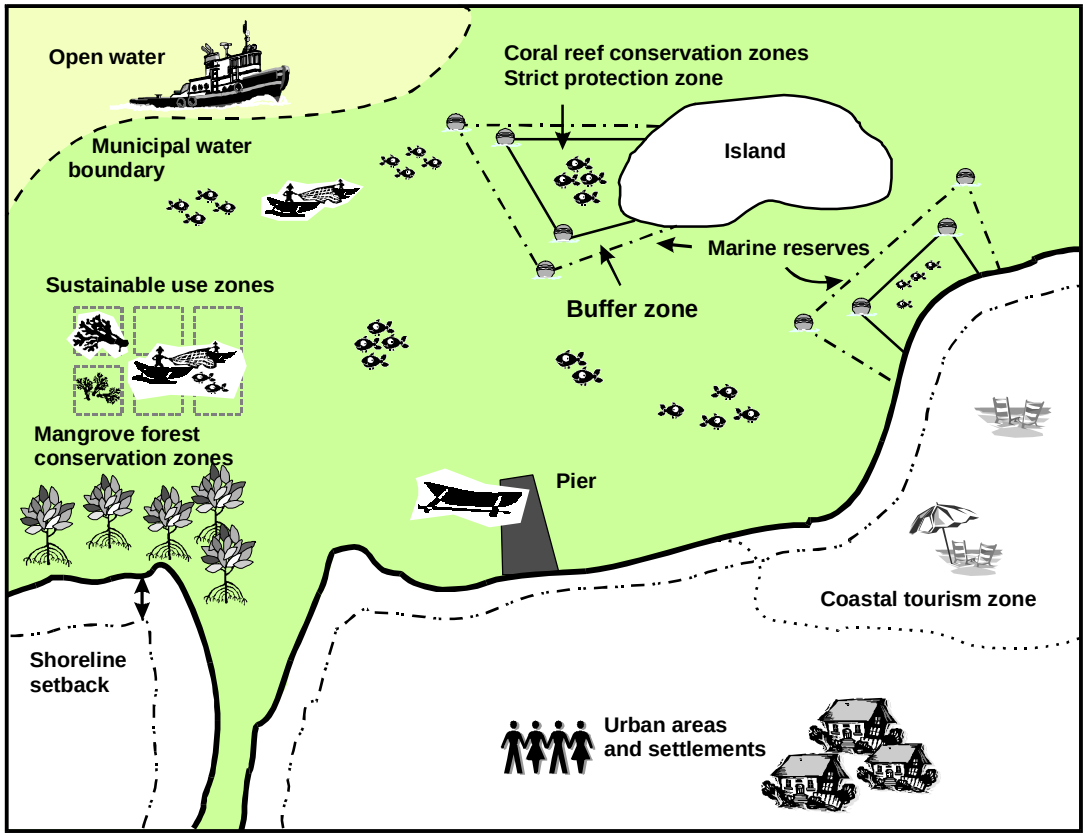


Figure 11: Illustrative zoning and resource use plan for the coastal area and municipal waters (not to scale)

b. Baseline information collected and stored for planning and monitoring
c. Information system and database established and functional

- **Resource management organizations formed and active**
  a. Fisheries and Aquatic Resources Management Councils (FARMCs) supported and active at *barangay*, municipal and multi-municipal levels
  b. Community stakeholder resource management organizations functional in assisting with CRM
- **Community participation ensured in CRM planning and implementation**
  a. Community organizing services provided as required
  b. Information and education provided to community stakeholders
  c. *Barangay*-level CRM plans developed and implemented
- **Habitat management implemented**
  a. Marine reserves and sanctuaries established for nearshore habitats (White 1988a, 1988b; De la Cruz and Militante 1996; Hermes 1998)
  b. Community-based Forest Management Agreements (CBFMAs) functional for mangrove habitat areas
  c. Zoning schemes developed for habitats and shoreline land
- **Fisheries management in place**
  a. Licensing and permitting schemes planned and established
  b. Seasonal and gear restrictions planned and implemented
  c. Level of fishing effort known and monitored for management
  d. Legal and financial incentives used to regulate fisheries
  e. Sustainable coastal aquaculture practices implemented
- **Coastal law enforcement available for CRM implementation**
  a. Municipal law enforcement units organized and functional
  b. *Barangay Bantay Dagat* groups and municipal fish wardens organized and effective
  c. Municipal water patrols operating in multi-municipal areas
  d. Court convictions obtained for illegal coastal activities
- **Shoreline development and pollution controls in place**
  a. Setbacks enforced for shoreline building and development
  b. Prevention of building any structures below high tide level enforced
  c. Domestic and industrial waste not dumped into the sea
  d. Watershed-level management plans in place
- **Enterprises encouraged that promote CRM**
  a. Tourism revenues harnessed to support local conservation
  b. Marine sanctuaries managed as enterprises to benefit local people
  c. Environment-friendly souvenir cottage industries promoted
  d. Employment encouraged outside of fisheries


CRMP

Participatory planning is an important part of CRM.

The best practices listed above must be carefully selected for given planning areas to address specific issues. The organization of activities to implement these CRM practices is always shown in a plan. Good coastal management plans are essential and should always have certain contents as shown in Table 6 and described in *Guidebook 3: Coastal Resource Management Planning* (DENR *et al.* 2001).

Table 6. Coastal resource management plan checklist

A coastal resource management plan for any area, *barangay*, municipality, city or multi-municipal area requires basic contents to make a good plan. The essential parts of a good plan are:

1. **Description of the area** provides background information. This can include geography, demography, important coastal resources and their condition, socioeconomic status of people, institutions and laws, and other relevant information for management. Use graphs and tables.
2. **Maps** of different scales needed. Include a map of the entire area and detailed maps of the coastal area with resource locations and use patterns, existing management interventions, and other data.
3. **Management issues** must be clearly stated along with their contributing causes and factors. Trends in decline of resources can be used to illustrate issues of concern.
4. **Goals and objectives** should be derived from the main issues. The goal is broad while each objective must be achievable and measurable within the 3- to 5-year life of the plan.
5. **Strategies and actions** are the heart of the plan. One strategy and several actions with assigned responsibilities should address each major issue. A strategy is a well-conceived means to solve a problem. The actions implement the strategy. Actions can be budgeted.
6. **Institutional and legal framework** is needed to support plan implementation. This section explains what institution is responsible and how it is supported by the law.
7. **Timeline** for implementation helps organize all responsible parties to implement the plan.
8. **Monitoring and evaluation** must be included as a set of activities to provide feedback on plan implementation and impact on environment.

Sustaining Coastal Management Through Multisectoral and Inter-LGU Collaboration

The capacity of local government to deliver coastal management as a basic service depends to a large extent on local leadership, community participation, inter-LGU cooperation and on support mechanisms from NGAs, NGOs, academe and the private sector. Each sector plays a substantive and vital role but all must work together toward the common goal of coastal management.

There are many cases where more than one municipality or city must enter into shared management arrangements where the marine and coastal ecosystem presents a larger management unit than one LGU can handle. Bays bordered by more than one

LGU require bay-wide management plans that are common to all concerned LGUs. Fisheries in such instances do not follow jurisdictional boundaries and must be planned and managed with an ecosystem focus.

Coastal areas with a complex mix of management issues to resolve require multisectoral arrangements and plans to address the issues. Areas with industrial or tourism development concerns require plans that are developed with the participation of the appropriate national agencies, private stakeholders and the concerned LGUs. Such plans must also consider economic criteria in decision-making that value natural coastal resource benefits and revenues (White and Cruz-Trinidad 1998).

All multisectoral and multi-municipal planning areas require the establishment and monitoring of baseline information and databases to measure the effectiveness of management activities. Academic institutions can play an important role in collecting and managing this baseline information. All coastal management implementation activities can only be measured for success if monitored results are checked against baseline information. Because management of information is not always done efficiently by government institutions, nongovernment institutions can assist with this important function.

SUMMARY

Integrated coastal management offers a framework to plan for tourism development within a broader context than site-specific projects or resorts. Coastal areas in the Philippines are beset with many types of development all of which add up to negative impacts on the coastal environment. Unless planning is done at a scale that encompasses a stretch of coastline and addresses various types of activities, any tourism site will suffer as seen in most coastal areas. ICM can help municipalities and cities plan for development through a process that involves all stakeholders, brings technical solutions and looks to the future.

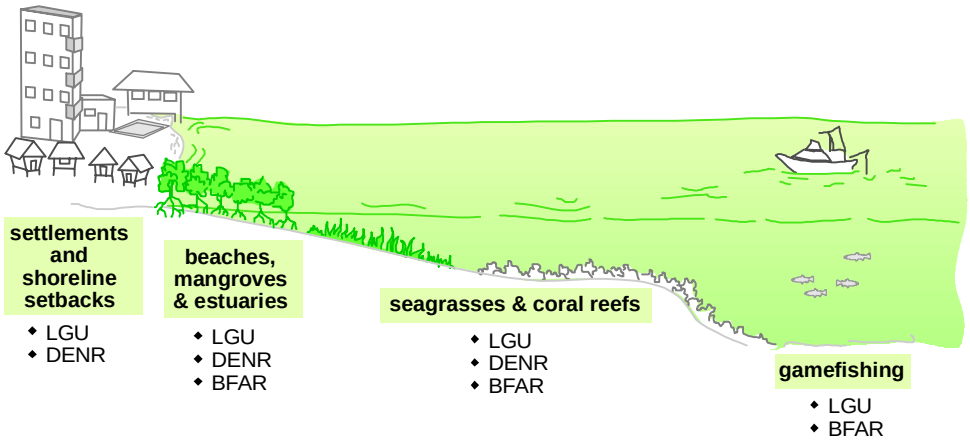
CHAPTER 3

Legal Framework for Managing Coastal Tourism Development

The laws governing coastal tourism development are not unreasonable or in excess—they just need to be followed!

This chapter provides a brief overview and orientation regarding the statutory requirements related to coastal environments and tourism development in the Philippines.

Both municipalities and provinces can set up tourist facilities but it is the Philippine Tourism Authority (PTA) that coordinates all tourism project plans (Presidential Decrees [PDs] 189 and 564). The role of the DENR is to see that the Environmental Impact Statement (EIS) System is implemented. DENR has issued several Administrative Orders (AOs) where and when this is required and how it should be implemented. Local governments are empowered to enact ordinances that cater to specific aspects of tourism-induced issues in their areas, like specific setback requirements or the use of anchor buoys which are not dealt with in detail by national laws. These local ordinances may be stricter than national laws if the conditions of local coastal resources require that. Agencies with prime responsibility in the coastal zone are shown in Figure 12.



LGU - local government unit; DENR - Department of Environment and Natural Resources; BFAR - Bureau of Fisheries and Aquatic Resources

Figure 12: Coastal zone and agencies with primary responsibility in management (DENR *et al.* 2001)

Developers and LGUs involved in coastal tourism development need to know what laws are applicable and what agencies to contact for permits and guidance in planning their development. Table 7 provides a list of possible issues, applicable laws and the agencies responsible for implementation and information.

Table 7. Reference guide to coastal development and legislation in the Philippines[1]

Category	Legislation and Responsibilities	Agency in charge
Environmental Impact Statement (EIS) System (see Chapter 6)	The newest regulation concerning Environmental Impact Assessment (EIA) in the Philippines is DENR Administrative Order No. 96-37: • EIA is done by the project proponent- the tourism developer- within the EIS System. • Initially, an Initial Environmental Examination (IEE) is required. • For larger projects or projects with potential significant environmental impacts within an Environmentally Critical Area (ECA), a more detailed Environmental Impact Statement (EIS) may be required by DENR. • Small resorts should request an Environmental Impact Checklist from DENR (similar to IEE). • After evaluation and approval of IEE, EIS, or checklist, DENR will issue an Environmental Compliance Certificate (ECC). IMPORTANT: ECC needs to be obtained prior to construction of tourism facilities	Environmental Management Bureau (EMB) Department of Environment and Natural Resources (DENR) or Protected Areas and Wildlife Bureau (PAWB) if a protected area is concerned DENR Regional Office
Critical habitats and endangered wildlife	• Coral reef, mangrove and estuarine ecosystems are critical habitats protected by the Fisheries Code (1998) (RA 8550) and various other laws that prevent destruction, degradation or alteration • Whales, dolphins, Dugong, whale shark, sea turtles, sea snakes, manta rays, milkfish, giant clams, Triton and Helmet shells and selected other mollusks, all stony and precious corals and the Coconut crab are protected from collection and alteration of habitat	DENR and BFAR Regional Offices, Local governments
Foreshore areas	• DENR Administrative Order No. 99-34 governing foreshore areas specifies the process for foreshore leases and limits the type of development	DENR Regional Offices

[1]For a more comprehensive review of legislation concerning coastal resources and coastal area development refer to DENR et al. (2001): Book No. 2.

(continued)

Table 7. (continued)

Category	Legislation	Agency in charge
Shoreline setback (see also Chapters 6 & 7)	• The Water Code of the Philippines (PD 1067), Article 51: The use of banks of rivers, lakes, streams and the shores of seas, throughout their entire length and within a distance of 3 m in urban areas, 20 m in agricultural areas, and 40 m along forest areas along their margins are subject to public easement where building of structures of any kind is prohibited. • DENR Administrative Order No. 97-05: 20 m direct measurements from the edge of the high water line, to be excluded from development and to be kept with vegetative cover and planted with trees. Sufficient measures shall be undertaken to prevent erosion.	DENR Regional Offices, Local governments
Marine protected areas	• The National Integrated Protected Areas System (NIPAS) Act (1992) mandates the protection of selected areas under the direction of a Protected Area Management Board (PAMB) that is locally constituted and chaired by DENR • The Local Government Code (RA 7160) and the Fisheries Code (RA 8550) mandate local governments to establish marine protected areas (marine reserves, marine sanctuaries, marine parks and variations thereof) that regulate uses and activities • DENR Administrative Order No. 2000-51: "Guidelines and Principles in Determining Fees for Access to and Sustainable Use of Resources in Protected Areas" provides guidelines to determine fees for protected areas under NIPAS jurisdiction	PAWB of DENR, Local governments
Marine tourism areas	• PD 1801 declares many small islands as tourism areas and limits other types of development in the specified area • DENR Administrative Order No. 99-31: "Ecological Destination Development Guidelines for Turtle Islands, Tawi-Tawi" details the types of development and activities allowed within the Turtle Islands Heritage Protected Area	Department of Tourism (DOT) PAWB of DENR
Ecotourism	• Presidential Executive Order No. 111/1999: Establishes an inter-agency National Ecotourism Development Council (NEDC) as policy-making body for ecotourism. • National ecotourism strategy, program, guidelines, etc.	DOT and DENR

(continued)

Table 7. (continued)

Category	Legislation	Agency in charge
	• Inter-agency Regional Ecotourism Committees (REC) approve and monitor ecotourism projects in the region. • DENR Administrative Order 2001-04: defines "ecological destinations"and sets guidelines on the establishment, development and management of ecological destinations and environmental rest area parks	DENR Regional Offices, Local governments
Small island development	• DENR Administrative Order No. 2000-83 concerning small island development • Refers to islands with an area of less than 50,000 hectares. • Islands less than 500 hectares are strict conservation areas, no renewal of leases allowed. • Islands of 500 to 5,000 hectares are under restricted use. For tourism: No construction and/or operation of casinos, high rise hotels (3 storeys and up), golf courses/driving range. • Islands of 5,000 to 50,000 hectares are open to sustainable development within the prescribed carrying capacity and subject to EIA. • ECC needed for development. • Sets out lease/rental fees for islands	DENR Application to Community Environment and Natural Resources Office (CENRO)

SUMMARY

The primary mandate for coastal management and hence coastal tourism has been largely devolved to local government under the Local Government Code of 1991 (RA 7160) and more recently defined in the Fisheries Code of 1998 (RA 8550). The only exception to the devolution of authority is under the framework of the National Integrated Protected Areas System whereby such areas are managed under a Protected Area Management Board that is locally constituted but chaired by DENR. These basic laws coupled with DENR regulations on Environmental Impact Assessment, wastewater emission, setbacks and development restrictions in shoreline and foreshore areas and various regulations affecting coastal ecosystems and wildlife comprise the bulk of legal control over tourism development in coastal areas.

CHAPTER 4

Planning for Sustainable Tourism

If we had been paid 50 cents for every word that has been written on sustainable development, we would be wealthy. If we had been paid 50 cents for every action taken, we would be paupers.

What is Sustainable Tourism?

International institutions have started to formulate strategies and principles for sustainable tourism development in parallel with the Department of Tourism in the Philippines. The planning tools of determining "carrying capacity" and the "limits of acceptable change" are increasingly being used along with "integrated master planning" described in this chapter. Stepping-stones in the growing worldwide awareness for sustainable tourism are the World Conference on Sustainable Tourism, Lanzarote, Canary Islands, Spain (1995), the International Conference of Environment Ministers on Biodiversity and Tourism, Berlin, Germany (1997) and the Manila Declaration on the Social Impact of Tourism, Manila, Philippines (1997).

The following points are important principles on the route to sustainable tourism:

- Tourism should integrate the natural, cultural and human environments. It must respect the fragile balances that characterize many tourist destinations through analysis of carrying capacity in particular for small islands and environmentally sensitive areas.
- Tourism must consider its effects on cultural heritage and traditional elements, activities and dynamics of each local community. These elements must at all times play a central role in the formulation of tourism strategies, particularly in developing countries.

- Sustainable development means the solidarity, mutual respect and participation of all players implicated in the process, especially those indigenous to the locality. This must be based on efficient cooperation mechanisms at all levels: local, national, regional and international.
- Government should promote actions for integrating the planning of tourism with environmental NGOs and local communities.
- Measures must be developed to permit a more equitable distribution of the benefits and burdens of tourism. This implies a change in consumption patterns and the introduction of resource users fees.
- Environmentally and culturally vulnerable spaces, both now and in the future, shall be given special priority in the matter of technical cooperation and financial aid for sustainable tourism development. Similarly, special treatment should be given to spaces that have been degraded by obsolete and high-impact tourism models.
- There is a need to support and promote feasibility studies, vigorous scientific field-work, tourism demonstration projects within the framework of sustainable development, the development of programs in the field of international cooperation, and the introduction of environmental management systems.
- Attention should be given to the role and environmental effects of transportation in tourism, and economic instruments should be developed and implemented to reduce the use of non-renewable energy.

The National Ecotourism Development Council of the Philippines has formulated a policy statement to guide tourism development in the Philippines. The summary of this policy is quoted below.

SUSTAINABLE TOURISM FRAMEWORK

In the beginning of life and it will be until the end, people are united with nature. This is the beninning triad of TIME, PEOPLE, and NATURE, the integrity of creation. Drawing from the Filipinos' mythical past of Malakas and Maganda or the biblical story of Adam and Eve, it is second nature to the Filipino to see the other person as a "fellow human being" (*kapwa-tao*). Hence, the concept of equality and partnership is nothing new to the Filipino. This is the concept that is at the heart of sustainable tourism in the Philippines.

Because of this unity with nature and this concept of equality and partnership, every family and community can be one in owning up the accountability to be stewards of the future:

- as a way of giving glory to the Creator,
- as a way of valuing human life and the legacy of our forefathers, and
- out of respect for the dignity of the human person.

(continued)

(Sustainable... continued)

This heart of gold in every Filipino, in every family and community is the soul of Philippine tourism. This is the driving force that will give life to and propel tourism. This is the ideal of motivation for sustainable tourism.

In pushing tourism forward, due consideration and diligence is given to the character, way of life, and ecology of every destination in the Philippines and also the needs of the world in the future. And priority is given to total human development. Character, way of life, and ecology of the Filipino are the building blocks or the main ingredients in developing tourism products appropriate for the destination —

About people, there's cultural, heritage, pilgrimage, and historical tourism.

About ecology, there's ecotourism, environmental or nature tourism, adventure tourism and the indigenous peoples' link to nature or ethnic tourism.

About people's way of life, there's rural, business & leisure, sports and health tourism.

The aspirations of every person, family and community are the very same goals of tourism in the Philippines: produce better yields, have a better place to live in, and be a better person and have a better family life.

So the efforts that will be put in by the present generation will be worthwhile and beneficial and will safeguard the welfare of the future generations, it is right and just to have a system that will monitor the effects of collective action. And Philippine Agenda 21 has identified six barometers: socio-cultural, economic, ecological, technological, institutional, and political viability.

Peace is the foundation and the essential ingredient of attractive tourism. Tourism promotes international and cross-cultural understanding, that is why it is referred to as the world's peace industry.

Building on the Filipino's value of *malasakit* or solicitous concern, customer focus should be the strategy for developing and marketing a tourist destination so that it will not only be globally competitive but more importantly through niche marketing the Philippines can find and establish its leading edge. The rich natural and cultural heritage of the Philippines allows for diversity in travel and tourism experiences and the unifying quality would be the innate good nature of the Filipinos. What every tourism masterplanner or practitioner should keep topmost in their mind when thinking customer focus is:

"IF YOU WANT TOURISTS TO FIND YOUR CITY/PROVINCE/MUNICIPALITY/*BARANGAY* ATTRACTIVE, THE RESIDENTS MUST FIRST FIND IT ATTRACTIVE."

Each community improves to reflect what the residents want for themselves and the community welcomes to their "home" whoever conducts himself or herself as a person should, and in return, the people reciprocate with graciousness and genuine hospitality.

(Sustainable... continued)

Every Filipino aspires for a well-ordered balanced and prosperous life — there is physical equity (good health), intellectual equity (continually expanding learning), spiritual equity (clear sense of life's purpose and meaningful life), psychological equity (self-esteem and positive self-concept), and financial equity (having enough money to meet the needs for subsistence). Equity in society is a vital strategy in sustainable development. Equity in society is not just about distribution of wealth. It begins with a keen sense of self and sustained by finding greater value and meaning in relationships. When the heart is empty, the head cannot think, and a full pocket only amplifies this emptiness.

Tourism is sustainable when it dignifies and makes people proud of it because people treat each other well; it satisfies the customer because there is a lot of caring; and it promotes well-being because it brings out the best in every Filipino.

When tourism is developed, managed and promoted in this manner then it will be alive, progressive, enduring, and continually beneficial because an EMPOWERED SOCIETY stewards it, TOURISM DEVELOPMENT is COMMUNITY-SUSTAINED, and GOVERNMENT NURTURES the INDUSTRY to make it GLOBAL in state of mind.

Truly sustainable tourism is the Philippines gift to the world because it lends to the BETTERMENT of the NATION, its people are imbued with a sense of nationhood because of renewed SENSE OF IDENTITY, PRIDE OF PLACE, and COMMITMENT.

Planning Tool I: Physical Carrying Capacity

The assessment of the physical carrying capacity in sensitive coastal environments is a good planning tool for sustainable tourism development. The carrying capacity is the level of visitor use an area can accommodate with high levels of satisfaction for visitors and few impacts on resources. The concept implies that there are limits to visitor use. In fact, most problems related to coastal development are the result of placing too much stress on limited coastal resources, exceeding the carrying capacity.

A formula to estimate the tourist carrying capacity of a given area consists of dividing the area to be used by tourists by the average individual 'standard' (usually in m^2/person) required (Boullón 1985). This individual standard, however, is not easily arrived at, and must be carefully defined for each particular case, since it involves at least three capacity variables: material, psychological and ecological.

Once this average standard has been specifically determined for each particular area, then planning can proceed with some degree of confidence knowing that a given development will not alter the environment of a site more than is acceptable. An example showing how to determine the carrying capacity is given in Table 8.

Table 8. Tourist carrying capacity of a given area

$$\text{Carrying capacity} = \frac{\text{Area used by tourists}}{\text{(Average individual standard or Area tolerance for visitations)*}}$$

Total number of daily visits = Carrying capacity x Rotation coefficient

$$\text{Rotation coefficient} = \frac{\text{Number of daily hours area is open for tourists}}{\text{Average time of one visit}}$$

Practical Example - Tárcoles River Dyke

a. Basic information and decision criteria:
- an open space that allows visitors to move about freely
- each standing person occupies an area of about 1 m^2
- there is no required distance between tour groups
- group size is, in this case, irrelevant
- one hour is required to visit the site
- it is open 12 hours a day
- the area available for visitors is 1,116 m^2

If one visit requires 1 hour and the site is open for 12 hours per day, then, theoretically, a person could make 12 visits in one day.

Following the above formula:

Potential Carrying Capacity (PCC) = 1,116 m^2 = 1,116 x 12 visits per day per visitor per 1 m^2

= 13,392 visits per day

b. Real carrying capacity (RCC)

RCC is defined as the maximum permissible number of visits to a site, once the corrective (i.e. reductive) factors (cf_1, cf_2, ...)derived from the particular characteristics of the site have been applied. These corrective factors are obtained by considering biophysical, environmental, ecological, social and management variables**.

The formula for measuring RCC is:

$$RCC = PCC \times \frac{100 - Cf_1}{100} \times \frac{100 - Cf_2}{100} \times \frac{100 - Cf_n}{100}$$

Corrective factors are expressed in percentage terms, using the following general formula:

$$Cf = \frac{M_1 \times 100}{M_t}$$

where Cf = corrective factor**
M_1 = limiting magnitude of the variable
M_t = total magnitude of the variable

*Determined by a survey of typical visitors to a given area or by research on the tolerance of a given environment to the impacts of visitors. (continued)

**Examples of corrective factors for coral reef use may include limit of boat anchorage sites, need for space of each diver/snorkeler, influence of visitors on a coastal community and others.

Table 8. (continued)

Example: Excessive sunshine at Tárcoles River Dyke

At this site, which has no roof cover for visitors, there are normally 12 hours of sunshine each day (06:00 - 18:00). Between 10:00 and 15:00 sunshine is intense, making visits to the site very uncomfortable. During the rainy season, which lasts three months, rain occurs between 12:00 and 18:00. Intense sunshine is accordingly reduced to the hours of 10:00-12:00. Hence, there are:

9 months without rain (dry season) = 270 sunny days per year
3 rainy months = 90 rainy days per year

M_{1a} = 270 days per year x 5 excessive sunshine hours per day = 1,350 hours of excessive sunshine per year.
M_{1b} = 90 days per year x 2 excessive sunshine hours per day = 180 hours of excessive sunshine per year.
M_1 = *1,530 total hours* of excessive sunshine per year.

The total hours of available sunshine (M_t) are:
M_{ta} = 270 sunny days per year x 12 sunshine hours per day = 3,240 hours of sunshine per year.
M_{tb} = 90 sunny days per year x 6 sunshine hours per day = 540 hours of sunshine per year.
M_t = *3,780 total hours* of sunshine per year.

$$Cf_{\text{sunshine}} = \frac{\text{1,530 total hours of excessive sunshine per year}}{\text{3,780 total hours of sunshine per year}} \times 100$$

Cf_{sunshine} = excessive sunshine factor = 40% limitation

Example: Rainfall at Tárcoles River Dyke

We know that there are 90 rainy days per year and that rain falls between 12:00 and 18:00, hindering normal visitation during those hours.

Hence:
M_1 = 90 rainy days per year x 6 hours limiting rain per day = 540 hours of limiting rain per year.
M_t = total number of visiting hours per year = 360 days x 12 hours per day = 4,320 visiting hours per year.

$$Cf_{\text{rainfall}} = \frac{540}{4{,}320} \times 100 = \text{rainy weather corrective factor} = 12.5\%$$

$$RCC = PCC \times \frac{100 - Cf_1}{100} \times \frac{100 - Cf_2}{100} \times \frac{100 - Cf_n}{100}$$

$$RCC = 13{,}392 \times \frac{100 - 40}{100} \times \frac{100 - 12.5}{100} = 13{,}392 \times (0.59 \times 0.875) = 13{,}392 \times 0.516$$

The Real Carrying Capacity (RCC) for this site is 6,914 visits per day.

Source: Ceballos-Lascuráin (1991)

Increasing carrying capacity

Carrying capacity can be reduced by both human and natural forces or can be maintained or increased through proper management. The following examples of management procedures can be used to increase carrying capacity:

- Design viewing tracks, trails, etc., to distribute use widely;
- Provide adequate information and interpretation services to minimize negative impacts;
- Increase durability of heavily used resources (e.g. surfacing materials, anchor buoys); and
- Provide facilities and design policies that encourage wet or off-season use.

Figure 13 illustrates the general relationship between carrying capacity, the coastal environment and tourism and may be used to determine corrective factors such as monsoons with high-energy wave impacts. Table 9 provides some common planning standards to determine carrying capacities of coastal areas and resort development.

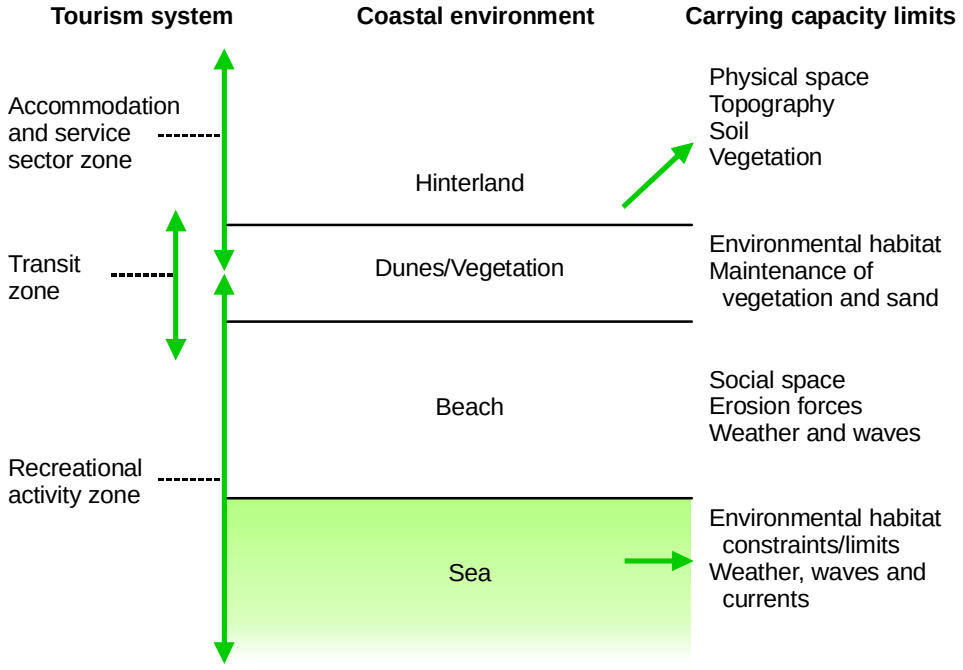


Figure 13: Physical carrying capacity of the coastal zone environment in relation to tourism (Pearce and Kirk 1986)

Table 9. Selected common planning standards to determine carrying capacities of coastal areas

TYPE OF ACCOMMODATION	SPACE REQUIRED
a) Hotels:	
Economy	10 m^2/bed
Average	19 m^2/bed
Luxury	30 m^2/bed
b) Seaside Holiday Village	15 m^2/bed
c) Apartments in beach resort studios:	
1-bedroom unit	53 m^2
2-bedroom unit	80 m^2
3-bedroom unit	110 m^2
INFRASTRUCTURE	**REQUIREMENT**
a) Water (daily consumption per person)	
Tropical beach resort	500-1,000 liters/day*
b) Sewage disposal (space needed with no main system)	0.3 hectare/1,000 persons
c) Parking facilities:	
Parking spaces	1 per 4 bedrooms
Overall density	5-25% of site
TOURIST FACILITIES	
a) Swimming pool (resort hotel)	3 m^2 of water/user
b) Open space (seaside resort)	20-40 m^2/bed
c) Shops	0.67 m^2/bed
BEACH CAPACITY	**m^2/person**
(for resort excluding facilities)	(persons/m of coast for 20-50 m beach)
a) Medium standard	15 (1.5-3.5)
b) Comfort standard	20 (1.0-2.5)
c) De luxe	30 (0.7-1.5)
RESORT DENSITY	
In Spain, Greece, Bali, Honolulu	60-100 beds/hectare
In Club Mediterranean Villages	20 beds/hectare

*Water consumption in luxurious hotels can increase to 1,500 to 2,000 liters/day per person.

Source: World Tourism Organization (1981)

Planning Tool II: Limits of Acceptable Change

There is no "zero impact" tourism. Thus, how much is too much? This question can be answered by determining carrying capacity of an area. But since carrying capacity is often difficult to specify, another approach, sometimes easier to determine is the limits of acceptable change (LAC) technique (Figure 14).

The process begins with the identification of important social and environmental indicators. The researchers who conduct the analysis are responsible for choosing

Figure 14: The limits of acceptable change planning system (Stankey *et al.* 1985)

participants who have long-term interest in the development area. These might include government officials, hotel proprietors, tourist guides, biologists and anthropologists. The specific types of people involved in this phase of the process will vary, however, according to the type of development area and its attractions. An ornithologist would be an obvious participant if the area includes birds that attract birdwatchers, whereas an anthropologist might better serve an area with ancient ruins or religious sites. Once this panel of experts has been chosen, the Delphi technique can be used to establish a consensus on the variables that require further study. By consulting as many parties as possible with an interest or role in tourism for the area in question, conflict can be avoided.

Limits of acceptable change have not been considered in many shoreline areas.

Delphi surveys are a widely accepted technique for gathering information on issues that are not easily quantifiable, such as the environmental and social impacts of tourism development. The process begins with an anonymous survey of selected individuals with an interest in a proposal or who possess relevant skills. The initial survey is intended to solicit the opinions of the respondents with respect to the impact of the proposed development. Subsequent surveys are used to

In the continuing process of uncontrolled development, physical AND social carrying capacities are often exceeded simultaneously. LAC would be set before local resentment is irreversible and unfriendly behavior towards tourists leads to decline of tourism visitation.

establish the relevant importance of the issues. This survey process is not infallible but can facilitate the planning process since it integrates the input of many relevant players.

One way to learn about what is acceptable change is to interview residents and outside users of an area. This was done for Boracay Island and indicated that the change had been too much based on experience (Table 10). But whether people are willing to act on this information is not known.

Table 10 shows that for Boracay Island half of the residents and over half of the tourists surveyed were not pleased with the general trends of tourism development. Residents and tourists alike are concerned over the unregulated degradation of the island. Tourist numbers are likely to drop if these trends remain unchanged, residents may experience lower incomes from tourism operations. Figure 15 shows how these trends progress and how the social climate between tourists and residents may worsen.

In Boracay, the need for more active control over development is a powerful issue and there is almost a complete consensus among residents and tourists who overwhelmingly support more control. The excessive stress on the infrastructure, ecosystem and community from rapid unplanned and unregulated growth suggests that the carrying capacity has been exceeded. The majority of residents agree that there should be limits to growth established.

Table 10. Resident and tourist perceptions of Boracay regarding changes in 1997

Question: Are you happy with the changes (trends) you see taking place on Boracay?

Residents			Tourists		
Yes	Somewhat	No	Yes	Somewhat	No
50%	18%	32%	43%	0%	57%

Question: Do you feel there is a need for more and better control over development on Boracay?

Residents			Tourists		
Yes	Somewhat	No	Yes	Somewhat	No
95%	5%	0%	86%	14%	0%

Question: Should there be limit set to growth?

Residents		
Yes	Somewhat	No
82%	0%	32%

Source: Trousdale (1997)

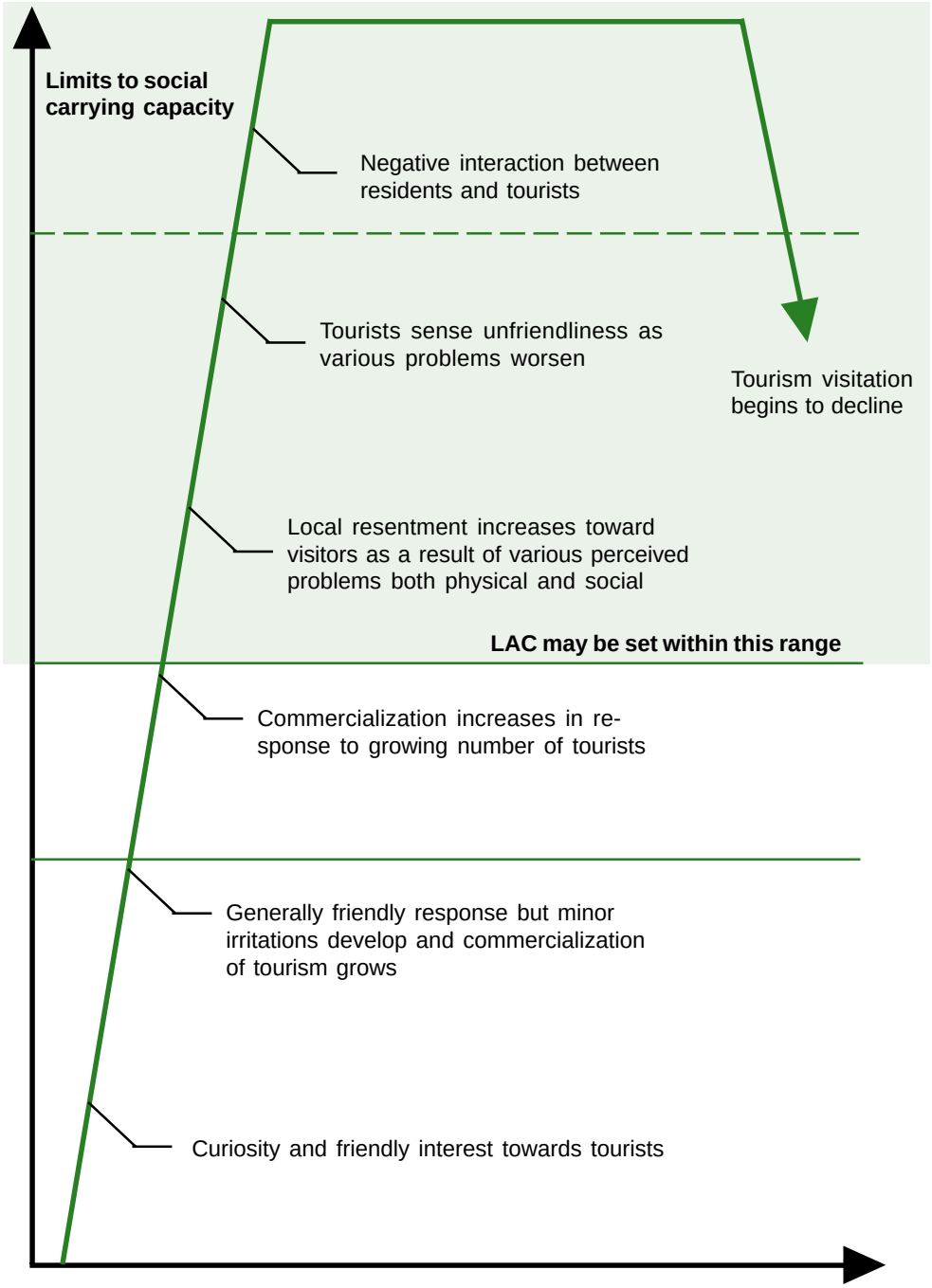


Figure 15: The relationship between tourist resident relations and carrying capacity (Murphy 1983)

The example shows that, having to face the negative impacts of unplanned development directly, residents and tourists alike accept limits of tourism growth. The concept of LAC aims to establish these limits up front. It is a useful early planning tool for LGUs and the tourism industry alike – before it is too late (Table 11).

Table 11. Possible indicators for physical coastal resource and social conditions for limits of acceptable change process

Coastal resource	Limits of acceptable change indicator
Coral reefs/marine water quality	• Physical damage to coral reefs from divers • Collection of reef organisms for souvenir industry • Increase in freshwater runoff and sediments from tourism operations (construction) • Introduction of waterborne pollutants from tourism operations (sewage, fertilizer, pesticides)
Mangroves	• Changes in freshwater runoff, salinity regime and tidal flow patterns • Excessive siltation • Introduction of pollutants • Conversion of mangrove habitat for building space or building materials
Seagrass beds	• Physical alterations • Excessive sedimentation or siltation • Introduction of excessive nutrients or pesticides
Salt marshes (tidal flats)	• Degradation of bird habitat or seed fish collection sites • Obstruction of stormwater runoff
Barrier beaches, sand dunes and spits	• Sand mining • Erosion • Dune migration
Estuaries/lagoons	• Encroachment into setback areas • Changes in sedimentation patterns • Changes to the salinity regime • Introduction of waterborne pollutants • Destruction of submerged and fringing vegetation • Inlet modifications • Loss of fishery habitat
Social	**Limits of acceptable change indicator**
Residents/tourist interactions	• Increase in local resentment towards tourists and vice-versa • Increased criminality and prostitution • Resident/tourist ratio during peak season
Employment opportunities/ ownership	• Percentage of local employees in low-paid and high-paid (management) jobs • Local/foreign employee ratio • Land tenure status • Level of foreign investment and foreign owned tourism projects
Cultural	• Increased influx of foreign workers • Increasing commercialization of cultural events and traditions and declining authenticity • Alienation of local culture (“Coca Cola/Mc Donald’s-Effect”) • Increase in cases of disrespect for local values, religious beliefs and traditions by outsiders • Declining interest for local culture amongst youth • Change in consumption pattern

PLANNING TOOL III: INTEGRATED MASTER PLANNING

This approach is often chosen by professional tourism developers with large-scale projects and encompasses generally the physical, economic and to a certain extent the environmental planning components. The principles can also be applied to projects of a smaller scale with various stakeholders involved such as LGUs and coastal communities. It compliments integrated coastal management (ICM) planning and can be incorporated within an ICM plan of a local government.

Integrated planning means incorporating a variety of baseline parameters. This includes physical data, e.g. topography, environmental data, socioeconomic and cultural data, and of course, data from economic and market studies. The following suggests a simple integrated planning process and expected outputs. It can serve as a guideline to integrate physical and economic planning with the needs of local communities and LGUs (Table 12 and Figure 16).

Table 12. Integrated master planning process

TASK 1 Establish Project Goals and Objectives with all Stakeholders
- Identify stakeholder groups with a long-term interest in an area, conduct initial meetings

TASK 2 Site Inspection and Additional Studies
- Rapid inventories of biological biodiversity hot spots for zoning into coastal tourism zones as well as critical environmental areas prone to disturbances (core zones).
- Community-based resource evaluation to provide data on areas with traditional land-use systems and land-use types.
- Market research (existing infrastructure and accessibility, expected number of visitors, etc.). Start of product planning.
- Physical site analysis (slope analysis, scenic areas, available water resources, physical access options, etc.).

IMPORTANT: Assess also the regional impacts of tourism and infrastructure development (e.g. improved access allows uncontrolled migration via newly built or improved roads).

TASK 3 Stakeholder Workshop
- Presentation of findings from environmental inventories, interviews, market research, site analysis
- Brain-storming session, suggest LAC and carrying capacity benchmarks

TASK 4 Conceptual Planning/Initial Feasibility Analysis
- Initial cost estimate and income generation potential/distribution system
- Concept plan and report
- Spreadsheet showing project uses, order of magnitude costs, absorption and phasing
- Presentation of conceptual master plan/alternatives to all stakeholders

TASK 5 Master Plan Refinement and Plan Selection
- Refinement of cost data, income generation and distribution system
- Final market studies
- Final plan based on market research, physical /ecological assessments, community involvement, phasing and cost

TASK 6 Presentation of Final Master Plan to Stakeholders
- Feedback and approval
- Final Plan preparation
- Final report, translation of text, cost estimate, electronic copies, available to the public

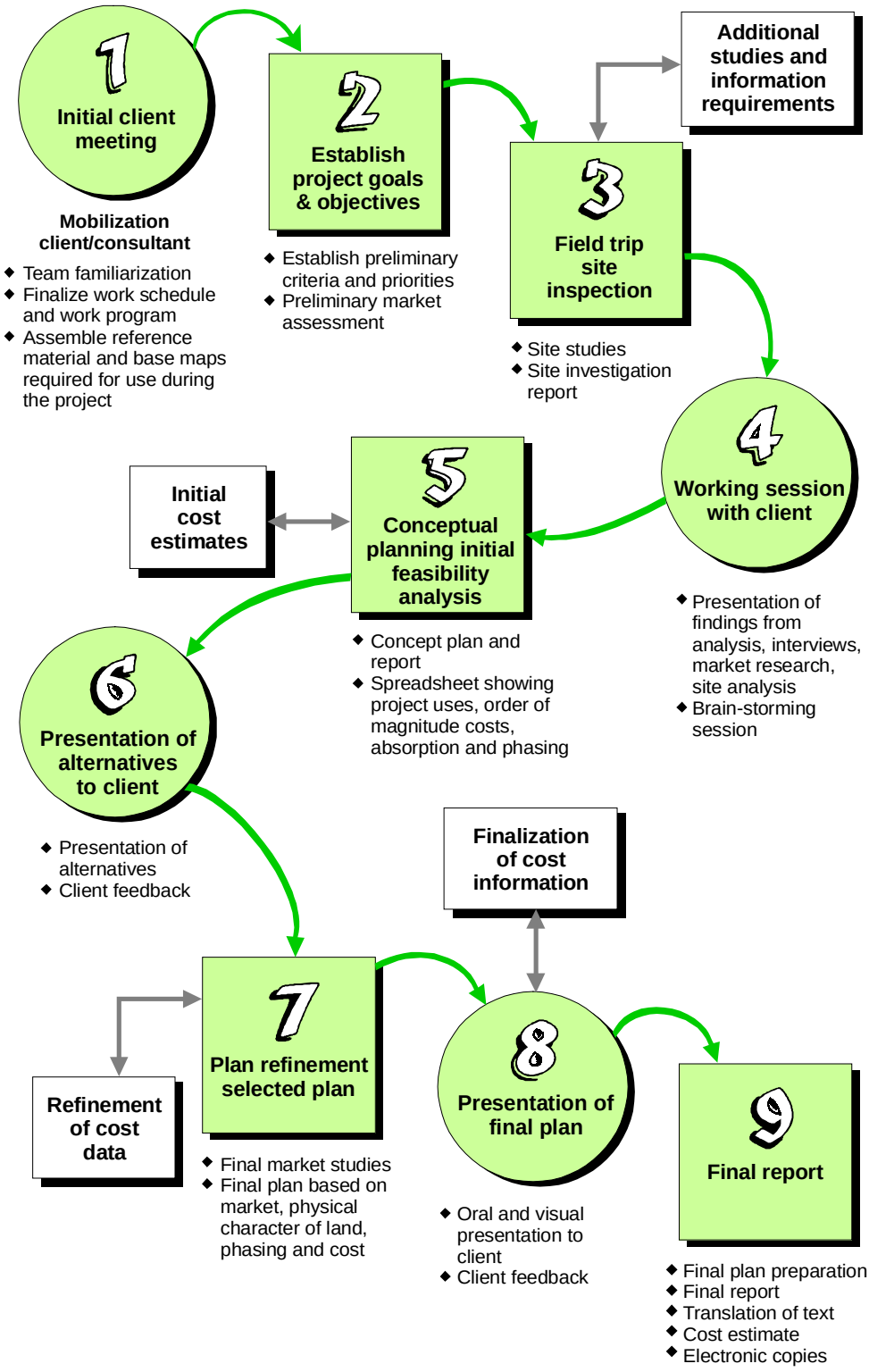


Figure 16: Planning process for private sector tourism projects
(Belt Collins 1996)

CASE STUDY: PALAWAN

Palawan Province is proactive in trying to present unsustainable coastal development. The case study that follows exhibits some of planning processes with development principles highlighted in this chapter.

CASE STUDY: PROVINCIAL AND MUNICIPAL PLANNING IN PALAWAN

Among all Philippine provinces, Palawan stands out environmentally because of its status as a major repository of biological diversity as well as an ecologically sensitive area. This reputation has given rise to a unique law called the Strategic Environmental Plan (SEP) for Palawan. The centerpiece of the SEP law is the creation of an Environmentally Critical Areas Network (ECAN), basically a zoning system that divides each of the province's 23 towns and the capital city into core zones, buffer zones, and multiple-use zones (with a tourism development component). Core zones are restricted areas, such as national parks, marine reserves and higher elevations that require maximum protection and minimal human intrusion. These core zones are surrounded by buffer zones, which are meant to shield the inner areas from economic activities. The lower elevations and generally more developed areas are designated as multiple-use zones, where most town sites and settlements are found.

Under the SEP law, equitable access to resources is emphasized and local community management is encouraged. Ecological viability and social acceptability of development projects are given importance. The Palawan Council for Sustainable Development (PCSD) was created to implement the law. To decentralize decision-making, ECAN boards are supposed to be organized in each municipality with members from LGUs, tribal groups and NGOs.

The underlying philosophy is to provide equitable access to the resources and to assign responsibility for their management to the LGU and the community. Palawan's ECAN Coastal Zone shall adopt the concept of marine parks and reserves, which usually requires limited entry and encourages various uses with emphasis on education, recreation and preservation.

It is the policy of PCSD to support and promote the sustainable development of Palawan through proper conservation, utilization and development of its natural resources to provide optimum yields on a continuing basis. It shall also promote and encourage the involvement of all sectors of society and maximize people participation in natural resource management, conservation and protection. PCSD also recognizes the significance of preserving and declaring certain areas free from human intervention to maintain ecological balance.

The PCSD has established a set of easy-to-implement guidelines for tourism development in coastal areas. These guidelines concerning planning and management of tourism establishments are not too technical and can be enforced and managed by LGUs to control tourism development (Table 13).

(Palawan... continued)

Table 13. Guidelines for tourism-oriented establishments in Palawan relevant to coastal areas

- The mandatory beach front easement along the coastline shall be established **at 5 m from the tree line** identified by LGUs. There shall be no permanent or temporary structures or signs for whatever purpose within the mandatory easement except those authorized by the LGUs.
- The established building line of 5 m from the mandatory beach front easement shall govern the siting of all structures along the coastline.
- All permanent structures shall at least be **10 m from the established high water level** of mangroves, swamps and freshwater lagoons.
- Construction along established waterways, intermittent or perennial, shall observe **the 5-m easement** on both sides of the waterway.
- Waterways that flow through or traverse a tourist development area shall not be relocated or blocked and any structure that will tend to impede the free flow of water shall not be allowed.
- The preservation of trees and other species of plants in the province is mandatory.
- Plants not indigenous to the province shall not be introduced unless properly cleared with the LGUs and the DENR.
- Solid waste shall be separated at source into recyclable, biodegradable and compostable material. If composting is to be done at backyards, the composting pit shall be located at least 25 m away from any water source and shall be covered with sufficient soil after every disposal.
- Discharge of wastewater from kitchen sinks, toilet and bath facilities shall be through appropriate connections to the septic tank, which shall be provided by all establishments either individually or communally. Septic tanks shall be located **at least 25 m away from any water source**. No septic tank shall be constructed under any building. The effluent from septic tanks shall be discharged into designated absorption fields.
- The use of indigenous materials, such as wood, *nipa*, and bamboo shall be encouraged. The overall design concept shall adopt Philippine architecture for tropical environment.
- In no case shall the management or accommodation facilities allow swimming in coastal waters beyond 10 p.m. and appropriate notices shall be posted within the establishment to inform the guests of this regulation.
- Any tourism-oriented establishment must prepare an Initial Environmental Examination (IEE) report. The concerned LGU, in consultation with the Tourism Committee of the PCSD, shall determine whether an Environmental Compliance Certificate (ECC) shall be required prior to the approval of the said application. However, an ECC must first be secured for establishments located in an Environmentally Critical Area (ECA), which includes mangroves, coral reefs, small islands, and areas classified as ECAN Core Zones by the PCSD.
- The LGU, in consultation with the PCSD through its Tourism Committee, may require the proponent to prepare an Environmental Impact Statement (EIS) in addition to the IEE, where it is deemed necessary in view of its potential environmental impact.

Source: Arquiza (1999)

SUMMARY

The "carrying capacity" of a tourism development area will depend on the extent and condition of the existing coastal resources in relation to the scale of development, the activities proposed and the potential impacts to be caused by development. Determining the "limits of acceptable change" can assist in establishing the carrying capacity for an area. Integrated master planning is a process for systematically developing an area-wide plan for tourism development that involves all the important stakeholders with an interest in the planning area and the project outcome. Carrying capacity is also addressed when environmental assessments are conducted for development projects as discussed in Chapter 6.

CHAPTER 5

Developing and Promoting an Ecotourism Venture

Ecotourism as a term is overused but real ecotourism can enhance environmental conservation and provide tangible benefits to local communities.

Product development is an essential part of any form of tourism development. You have to know your market to be able to offer the right tourism product. For conventional coastal tourism projects the developer will conduct a market analysis and feasibility study prior and as part of the early planning process. Medium and small-scale coastal tourism projects should consider a similar approach to set up a successful and professional business.

Product standards and requirements for small and medium-scale projects are considerably different from large-scale coastal tourism developments. Small and medium-scale developers are more likely to venture into niche markets. That is why we are presenting the product development process for a coastal *ecotourism* product.

The focus of this chapter is the "software" of ecotourism. This consists of the "ecotour" and other attractions visitors will experience during their stay. The "hardware" of ecotourism, e.g. boats for transportation, accommodations and restaurants is addressed in later chapters.

What is Ecotourism?

There is no widely agreed definition of ecotourism and much of the travel industry literature fails to differentiate between nature-based mass tourism (such as scuba diving in general or destinations like the Galapagos Islands) and ecotourism. The International Ecotourism Society defines ecotourism as: "*responsible travel to natural areas, which conserves*

the environment and sustains the well-being of local people" (Lindberg and Hawkins 1993). Integrating the element of scale is one of the key factors that determines the environmental compatibility of any tourism activity. Thus, ecotourism is used to refer to a scale that is small with limited ecological and social impacts.

Promoting conservation objectives is a significant role of ecotourism. Apart from educating the guests about local environmental and conservation issues, revenue from ecotourism should at least partially finance the costs of protecting natural areas. In the case of Gilutongan Marine Sanctuary in Cordova, Cebu, this is achieved by levying a user fee from tourists. This fee can be integrated into the price for the ecotour or the ecotourism product, or earmarked as a separate contribution for the project's conservation activities. In the latter case, the ecotourists will have a more active feeling of supporting conservation as the money is used for a specific purpose. In some cases the contribution may be voluntary, in other cases where these revenues are the sole source of funds for the operation of a conservation area or program, they may be fixed at a certain amount.

Ecotourism depends on healthy and abundant marine life such as these dolphins in the Tañon Strait.

Ecotourism should bring economic benefits to local people in the area of the tourism activity. That may include a wider range of locally owned and operated tourism businesses such as tour operators and travel agents, small and medium guesthouses and hotels amongst others.

Community-based ecotourism focuses on improving the livelihoods of poor people in rural environments. This form of tourism can be built on natural resources and cultures, which are often the only real tourism assets that the poor have. It has the potential of offering alternative livelihoods with benefits for education and health care for the involved community members (Boo 1990). Most of the people involved have no previous backgrounds in the tourism industry. In Olango, near Mactan Island, they are fisherfolks from the coastal village Suba.

Poverty forces people to exploit natural resources in unsustainable ways due to lack of alternative income opportunities. In coastal areas, this often means destructive fishing methods such as dynamite fishing or overharvesting. Community-based tourism may be able to achieve two goals: a) provide alternative livelihood and income to the poor, and b) offer more sustainable means of utilizing and conserving natural resources.

Ecotourism development covers a wide range of activities: strategic planning, product development, physical development, visitor education and management, market research, enterprise development, tourism stakeholders management and environmental impact management. Community-based ecotourism adds the element of community organizing and capacity-building. Training of tourism skills is most essential.

Ecotourism also involves the development of different kinds of products that ensure safe, enjoyable, comfortable and well-informed travel that are then sold to tourists. Products and services include all types of transportation to and from the tourist destinations, food and drinks, accommodation, tours, tour guiding, tour books, facilities for interpretation, rest, recreation and other things. Differences between "ecotourism" and nature-based mass tourism are highlighted in Table 14.

Table 14. Checklist to differentiate ecotourism from nature-based mass tourism

Indicator	Ecotourism	Nature-based mass tourism/ nature tourism
Scale	• Small to middle scale, slow growth	• All scales, fast progression to large scale
Investment strategy	• Moderate/low investment, balancing supporting infrastructure development between the needs for access and the environmental impacts connected with infrastructure development	• High investment • Extensive supporting infrastructure development • Priority to allow for fast, easy and comfortable access
Development goals	• Promote conservation objectives, provide funding for protected area management • Earning potential for local communities, promoting small-scale local business ventures	• Promote national development objectives, distribute funds to central governmental agencies • Leakage of revenues from rural areas to city-based operators, airlines, travel agencies
Planning parameter	• Unique location • Stay within carrying capacity, establish LAC • Services, price	• High guest capacity • Services and prices
Activities	• Scientific tourism • Wildlife watching with interpretation facilities and services • Nature photography • Voluntary environmental programs (inventorying, monitoring) • Low impact/low intensity adventure/sports activities (e.g. Whitewater rafting)	• Fishing and hunting • High impact/high intensity adventure/sports activities (e.g. 4x4 wheel drive safari in rainforests) • Non-individual, high comfort nature tours (e.g. AC-coaches) • Combination with other non-nature related activities (e.g. ship cruises)
Key attractions focus	• Natural surroundings first • Facilities second (basic needs) • Educational/activity focus	• Natural surroundings and facilities equal • Recreational/relaxation focus

Source: Hüttche (1998a)

Important points to remember are that community-based ecotourism:

- Provides alternative livelihood and income to the poor;
- Occurs at a small scale with limited ecological and social impacts;
- Offers a means of support for conservation of natural resources; and
- Contributes to the financing of conservation areas and programs.

Entrance ticket to the community-based marine sanctuary at Gilutongan Island where user fees benefit the community and the local government, while financing its maintenance.

KNOWING THE MARKET

In ecotourism, as in other travel segments, guests have different motivations to visit the area. Accessing market data from the Department of Tourism (DOT) and other sources will greatly improve chances to develop a viable tourism product. Visitors can generally be divided into two groups as shown in Table 15.

Table 15. Visitor expectations in different target markets

Casual or popular wildlife viewer	Serious nature observer
• Day-tripper, as part of a tour program, or just fun seeker	• Spends unhurried periods of time in areas of unspoiled wilderness
• Stays at comfortable resort or hotel in vicinity	• Accepts simple facilities and inconveniences in intact and remote environments
• Wants "spectacular encounters" with wild animals without too much 'sweat' and inconveniences	• More appreciative of the whole ecosystem and less spectacular species and observations • Serious interest in education and interpretation • Part-time scientists

Source: Hüttche (1998a)

In early 1998, a survey of tourists in Port Barton, Palawan was made to provide information for improving Port Barton as a tourist destination. The results highlight some characteristics of tourists coming to the Philippines and to what extent they are seeking nature-based destinations and ecotourism experiences. The results are highlighted in Table 16.

Table 16. Results of visitor survey in Port Barton, Palawan

Sample size: 23; Average age: 34 years; 19-73 years of age; 56% female

Duration of stay: Average stay in the Philippines was 3.5 weeks; average stay on Palawan Island 12 days; average stay in Port Barton 4 days

Access: 70% came by boat with an average cost of PhP600 per person (one-way); others came by land from Puerto Princesa City

Activities in the order of frequency: relaxation, snorkeling, island hopping, sightseeing, scuba diving, hiking and swimming

Accommodation and price: 50% said price was a primary factor in their choice of resort; average lodging was PhP260 (US$6.50) per person per night; spent average of PhP670 (US$17) per person per day

Type of visitor: 70% scuba divers and snorkelers

Willingness to pay for conservation: All willing to contribute an average of PhP120 (US$3) per person as user fee to a marine sanctuary; 78% would contribute an average of PhP150 (US$3.75) to an environmental fund; 60% said there was a need for an information center in Port Barton

Perceived problems: 50% felt there were environmental problems in Port Barton; complaints in order of importance: litter on the beach, deforestation, coral damage, forest fires and noise

Perceived attractions: most enjoyable reasons for coming: snorkeling, the local people, sightseeing, island hopping, the beach, relaxed atmosphere and swimming

How to improve Port Barton: Most common answers were related to maintaining the cleanliness of the area, followed by "Don't change anything, Port Barton is beautiful." Other suggestions related to improving transportation, the roads and accommodations

Most needed to protect the area: Mooring buoys at frequented reefs and for boatmen to avoid anchor damage on the reefs; education regarding coral ecosystems and putting up informational signs about corals at strategic locations; preserving the natural surroundings of the area; keeping the area small and simple to preserve its character thus preferring few vehicles and no large-scale developments or hotels

Source: Arquiza (1999)

Underwater research and monitoring as a way of learning and assisting locally attracts some international and local tourists.

Developing an Ecotour

The process of planning, testing and implementing is described in the following case study by Flores (1999). The resulting "Olango Birds and Seascape Tour" is now functional and managed by a community-based enterprise group.

CASE STUDY:
THE ECOTOUR DEVELOPMENT PROCESS

Based on a pre-determined itinerary and time, an ecotour product is created by skillfully combining different kinds of tourism resources (tourism attractions and activities), tourism workers (e.g. guides, boatmen, cooks), tourism products (crafts, food, accommodations) and many others to enable tourists to have an active experience with the natural environment and local culture (Figure 17).

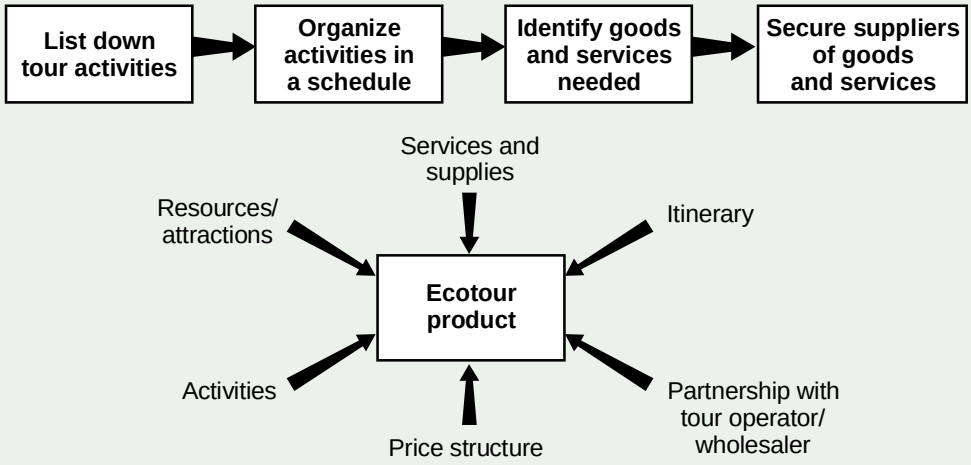


Figure 17: Necessary steps and components for the ecotourism product development process (Flores 1999)

An ecotour is a good product for developing community-based enterprise ventures. Once linked to a viable market, an ecotour venture can provide a good income source for a core group of community owners, while providing supplemental incomes to more people who are providing services and supplies to the tour. As tourism grows, ancillary enterprises can be developed around new products and activities such as handicrafts, biking or kayaking, bed and breakfast, camping facilities and others.

By providing economic incentives to a wide group of local people, an ecotour venture can catalyze environmental awareness and commitment by the local people to protect the natural resources on which their livelihood depends. Moreover, the tour visits help bring national and international attention to protected areas, providing additional opportunities for leveraging policy and resource support for conservation.

To optimize the benefits of ecotourism for the local community and environment, it is important to pay attention to market information and linkages, planning, local participation and benefits, stakeholder education and natural resource management. Determining whether an ecotour venture is appropriate for a given area requires considering the following:

a) Are there appropriate ecotourism resources to attract visitors to come to the area?

(continued)

b) Is there something unique (attraction, experience, knowledge, package, price) that is competitive in relation to other local tour products or those being visited by target tourists?
c) Is the area accessible to tourists safely, reliably and regularly?
d) Are there tour operators and brokers who could sell the product directly to tourists and who could be responsible in bringing the tourists to the area?
e) Are there dedicated tourism workers (people who will work in the venture) who enjoy relating with people and working hard and are willing to commit to work even in difficult times?
f) Are the people in the community organized for and involved in decision-making on ecotourism development in their area?
g) Will the community share in the economic benefits of the ecotour venture?
h) Are government bodies on local development, resource and tourism management in the area supportive of the planned venture?
i) Do the community, concerned public agencies or private groups integrate the ecotour venture in a larger environmental conservation effort?
j) Will there be a professional business management system to run the venture in the locality?
k) Is there access to financing for starting the venture?

Ecotourism Product Development – Step by Step

The steps to develop an ecotourism product are outlined in Figure 18 and explained in more detail below. This process will vary from one project to another depending on the local context, needs and potential (Lindberg and Hawkins 1993).

1. ***Identify and assess existing and potential ecotour resources in the target area***
Ecotour resources are natural, cultural or historical attractions in a given locality. These are the core resources for ecotour product development. Attractions can be places, objects, events and people's unique way of life. Natural attractions include surf and beaches, coral reefs, mangroves, rivers and waterfalls, caves, mountains and cliffs, forests and lakes. Cultural and historical attractions include

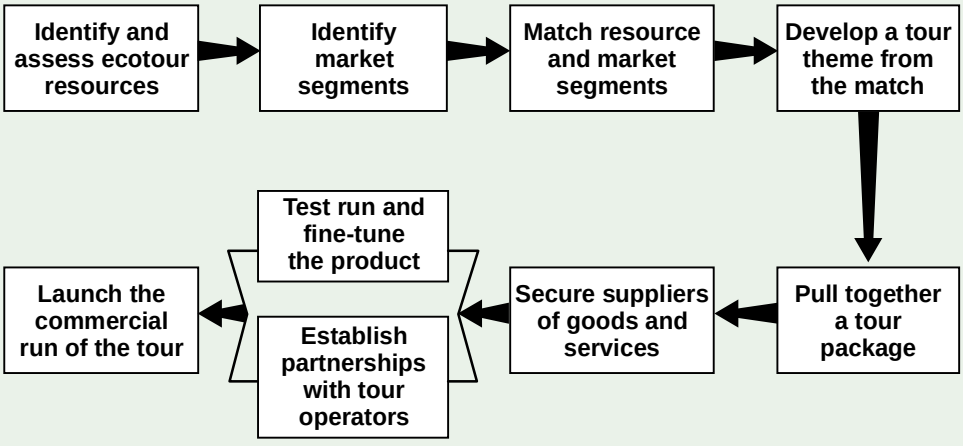


Figure 18: Ecotourism product development steps (Flores 1999)

(continued)

churches, artifacts, festivals, rites and rituals, traditional production (such as fishing, loom weaving, woodcarving and brass making) as well as annual local competitions like *banca* (boat) and *carabao* (water-buffalo) races.

Other important resources that need to be identified and assessed are: food and accommodation services, stores (for souvenirs, film, rentals or sale of outdoor gear), transportation, information services, access to infrastructure (ports, communications, roads and trails), public services (police, rescue, health and medical) and local skills (cooks, guides, boatmen, entertainers, natural and cultural interpreters, etc.). If any of these resources are not available locally, identify the nearest place where they are available or what training is required.

Knowledge of available financial services and organizations assisting in ecotourism development is useful.

To start the identification process, make a list of attractions with a brief description of what is unique or special about them. Begin with attractions that are already popular with locals and visitors. Proceed to list other less popular but potential ecotour attractions.

Score the resources identified for: attractiveness, ability to draw visitors, accessibility, integrity and contribution to environmental conservation and cultural promotion. A higher score indicates a greater resource potential for ecotour product development.

2. Identify market segments

Identify and analyze existing local tour destinations and products. Destinations are places and events that attract visitors. Products are tour packages that are put together by tour operators. In places where there are no tourists yet, get information about destinations and products near the locality. What kind of visitor goes there (include both local and foreign)? Where do they come from? How many and from what month to what month do they visit (seasonality)? Who brings them (tour operator)? What activities do they engage in? How long do they stay? How much do they spend? Be specific with the data gathering. List down names and places. Primary and secondary data can be gathered from the nearest Department of Tourism (DOT) office, local tour operators, guides and local residents around the destination. Interviews with the visitors themselves are very useful.

Group the visitors according to activities that they engage in. List the visitor groups under one column and the activities under another column. This exercise should give a good picture of the nature of the existing accessible visitor markets. Remember that schools and companies are also potential markets.

(continued)

3. *Match resources and market segments*

Organize the list of local resources and visitor groups into a matrix (Table 17). Draw lines connecting resources that match with a market segment and vice-versa. Count the number of matches for each resource and market segment. The three highest scores in each column will be the resource and market segment that should be pursued for tour product development.

4. *Develop a theme*

A tour theme is a clear, concise statement that aptly describes and captures the combination of natural resources resulting from the resource-market matches. The tour theme provides guidance on how to weave the activities and itinerary that will be developed from the identified resources and target market segment. Try to differentiate the theme from existing tour products. Examples are:

- Mount Isarog is but a glimpse into the vanishing biological diversity of ancient Philippines.

Scuba diving on coral reefs is a very popular activity among coastal tourists.

Table 17. Matching visitor groups and resources or attractions

Resources	Visitor groups	Matches
Pristine coral reefs	Divers/snorkelers/swimmers	4
Whales and dolphins	Nature enthusiasts	4
White sand beaches	Researchers	4
Mangrove forest	Students	7
Old coastal churches	Botanists	1
Indigenous cultures/festivals	Culture enthusiasts	2
Endangered wildlife/birds	Birdwatchers	2
Shipwrecks	Ecotourists	11
Surfing areas	Surfers	1
Kayaking, camping, etc.		
Marine parks	Adventure travelers	3

Divers	Shipwrecks and coral reefs of Coron: diving and snorkeling
Surfers	Cloud nine surf in Siargao: surfing and swimming
Birdwatchers	Bird sanctuary in Olango
Nature enthusiasts	Tañon Strait: whale and dolphin watching
Researchers	Mangroves, sea turtle nesting places
Mountaineers	Mountains and rocky cliffs, Batangas, Mount Halcon, Mindoro Oriental
Collectors	Craft villages, Lake Sebu
Adventure travelers	Kayaking, camping, trekking, remote areas
School/students	Nature parks

Source: Flores (1999)

(continued)

FLORES

Community participation in an ecotour develops pride and ownership in the community.

- Six hundred years in the making, the eruption of Mt. Pinatubo demonstrated the raw power simmering inside the earth.

If a tour has a variety of attractions, it can have different sub-themes that are unique to each attraction such as:

- Migratory birds from Japan, Russia and China are genetically programmed to stop over Olango, Cebu during their seasonal round trips to avoid cold weather.
- Seahorses are monogamous and will not breed once separated from their partners (Bohol).

Low impact recreation activities such as ocean kayaking is gaining popularity.

5. Put the tour product together

Develop a tour product that reflects the theme. A tour product is a combination of identified resources, services and activities organized around the theme in a way that will interest and satisfy the target market segment. Steps in the process include:

a. Identify product components by answering the questions: what to see, where to go, how to go, what activities, what to eat, where to eat and where to stay (rest and sleep).

b. Arrange activities sequentially into a tour itinerary including stops for meals and rest. Specify the duration of the entire tour and the duration of each activity including travel time. A half-day or one-day tour product is recommended for starters. Identify the goods and services needed.

c. Identify and secure suppliers for required goods and services necessary for the operation of the tour.

The Olango Birds and Seascape Tour is an ecotour product owned and run by the villagers of Suba, in Olango Island, Cebu. It features a boat tour around several islets just off Mactan Island; a canoe ride through shallow waters and mangroves to see various species—some endangered—of migratory birds; and the hospitality of a quiet and friendly coastal village. There are 41 fisherfolk, women and youth that benefit from the venture who have become active community partners in the conservation of the Olango Island Wildlife Sanctuary and the surrounding seas. Leading national inbound tour companies have committed to promote and sell the product to their clients. The community ecotourism venture was assisted by the Coastal Resource Management Project and enjoys the support of the local Protected Area Management Board (PAMB), the Department of Environment and Natural Resources and the Department of Tourism in Region 7. A sample itinerary is shown in Table 18.

(continued)

(The Ecotour... continued)

Table 18. Sample itinerary for Olango Birds and Seascape Tour

9:00 am	Rendezvous and pre-departure briefing at a dock in Mactan
9:15 am	Cruising by boat to Suba, Olango Island; Interpretation of Olango Islets along the way
10:00 am	Paddling on outrigger canoe "baroto" or "banca" to Suba beach
10:15 am	Welcome drinks and fishing demonstration by a local fisherman
10:30 am	Bird briefing by a naturalist interpreter
10:45 am	Paddleboat along Suba channel and walk to the birdwatching area
11:15 am	Birdwatching
12:00 nn	Paddleboat back to Suba beach
12:15 pm	Lunch on Suba beach
1:00 pm	Shellcraft, interactive "cassava and siakoy" cooking, entertainment
1:45 pm	Farewell activities
2:00 pm	Paddleboat back to boat
2:15 pm	Boat cruise to the open sea aquarium at Gilutongan Island
2:45 pm	Swimming or snorkeling at the Gilutongan Marine Sanctuary
3:15 pm	Head back by boat to Mactan Island

6. Secure suppliers of goods and services and cost the tour

Determine the kind and frequency of goods and services that the tour product would need from the start to the ending point of the tour. Generally, these are:

a) Transfers from visitor pickup point to tour starting point and back
b) Accommodations such as homestay, camp, hotel and/or lodges
c) Food (meals, snacks, drinks)
d) Charters (for boats, jeeps/trucks) for travel between attractions
e) Guide services
f) Local entertainers

List tour operators and suppliers of goods and services, get price quotations, put them together and then add 30% to estimate the selling price of the tour (Table 19).

7. Test and fine-tune the product

Do several test runs of the tour and evaluate every run. Cultivate relationships with tour operators by inviting them to the test runs (commonly referred to in the industry as "fam tours" or familiarization tours). Another way of testing and promoting the new ecotour product is to mark the tour as a promotional or exploratory run and offer the product at cost. Again, make sure that the tourists give their feedback about the tour.

(continued)

Table 19. Costing and pricing for an ecotour

Costing and pricing (Based on 10-20 tourists per trip)

Costing per trip: Items:	Total cost (Pesos)	Cost per tourist (Pesos 1998)
Local services (for paddling, cooking, hospitality, entertainment)	3,295	329.5
1 Local tour coordinator	200	20
1 Head paddler	175	17.5
1 Head cook	175	17.5
1 Hospitality coordinator	150	15
2 Paddler-guides (PhP150 each)	300	30
10 Paddlers (PhP100 each)	1,000	100
1 Assistant cook	120	12
2 Demo-cooking attendants (PhP100 each)	200	20
3 Food assistants (PhP75 each)	225	22.5
5 Guest attendants/cleaners (PhP75 each)	375	37.5
5 Entertainers (PhP75 each)	375	37.5
Naturalist interpreters (PhP400 x 2 persons)	800	80
Sanctuary entrance fee (PhP8 x 10 persons)	80	8
Environmental fund contribution (PhP50 x 10 tourists)	500	50
Community fund contribution (PhP50 x 10 tourists)	500	50
Hut rental	300	30
Water for washing	120	12
Meals and fruits (PhP150 x 13 tourists and guides)	1,950	195
Buko (coconut), softdrink, bottled water, ice (PhP50 x 13)	650	65
Ingredients for demo-cooking of native delicacy	200	20
Use of binoculars (PhP20 x 10 tourists)	200	20
Tour brochure and other literature (PhP50 x 10 tourists)	500	50
Welcome necklace (PhP10 x 10 tourists)	100	10
Boat rental	1,200	120
Miscellaneous transportation	800	80
Communication	200	20
Total	**11,395** (US$ 285)	**1,139.5** (US$ 28.5)
Add: Profit margin	4,205 (US$ 105)	420.5 (US$ 10.5)

Exchange rate: PhP40 - US$1

Source: Flores (2001)

Depending on how quickly fine-tuning can be done, test runs can graduate to full commercial runs after three to five trial runs. This usually takes a full tourist season or one year.

8. Establish marketing partnerships and promotion

Establish marketing partnerships with tour operators and guide associations. Tour products are best marketed through established tour operators and guide associations. They have links to the market and know their way around the

(continued)

(The Ecotour... continued)

industry. Choose tour operators that share or are sympathetic to the mission and objectives of your ecotour. At least, get operators who deal fairly in business.

A familiarization tour of the chosen tour operators is one of the best ways to establish marketing partnerships. While usually covered by the product tour developer, the costs of the "fam tour" may be shared with the guests.

Once it is agreed that the tour product is viable, get the details of pricing, bookings and payment systems. Tour operators add on at least a 30% margin to the tour product price to cover their marketing and administrative expenses plus profit.

FLORES

A demonstration presented by the women of Suba, Olango Island to tour guests.

In the case of the Olango Birds and Seascape Tour, the members of the Cebu Association of Tour Operators were invited along with other specialist operators such as dive centers to attend the familiarization tour. The tour operators participated as ordinary tourists to experience the whole package first hand. This enables them to sell the package to their customers having experienced the tour personally. As industry professionals with extensive experience the tour operators' feedback and suggestions were of great value for the fine-tuning process.

SUMMARY

Ecotourism is not an easy panacea to replace the problems created by more traditional forms of mass tourism. Rather, it requires good planning and product development so it can cater to a more special clientele than mass tourism. It needs to first determine the attractiveness of a local natural resource or tradition and then harness a tourism market interested in the attraction and maintain it through management and marketing. These ingredients do not come easily and require organized and well-run businesses or community groups. Coastal community involvement in ecotourism as a livelihood is possible as long as the community is willing to be organized as a business entity and learn to regard its environment and traditions highly so that their pride and care can be selling points of their tourism product.

CHAPTER 6

Environmental Impact Assessment

Environmental Impact Assessment (EIA) is the process of assessing potential impacts of a planned project and designing appropriate preventive, mitigating and enhancement measures. EIA should be done early when plans can still accommodate required changes. Otherwise, EIA becomes a pointless exercise.

All development projects that occur in Environmentally Critical Areas (ECAs) or those that are considered Environmentally Critical Projects (ECPs) as defined under Presidential Proclamation No. 2146, Series of 1981 and presented in Table 20 are covered by the Environmental Impact Statement (EIS) System. As such, they are required to obtain an Environmental Clearance Certificate (ECC) after undertaking an Environmental Impact Assessment (EIA).

Table 20. ECAs requiring an ECC before development can occur

- Protected areas such as national parks, watershed reserves, wildlife preserves and sanctuaries declared by law; seascapes
- Areas set aside as potential tourist spots;
- Habitats of endangered or threatened species indigenous to the Philippines;
- Areas of unique historic, archaeological or scientific interest;
- Areas traditionally occupied by indigenous people and cultural communities;
- Areas frequently hit by natural calamities (geologic hazards, floods, typhoons, volcanic activity, etc.);
- Areas with critical (steep) slopes;
- Areas classified as prime agricultural lands;
- Aquifer recharge areas;
- Water bodies used for domestic supply or support of fish and wildlife;
- Mangrove areas supporting critical ecological functions or on which people depend for livelihood;
- Coral reefs which have critical ecological functions; and
- Areas which are ecologically, socially or geologically sensitive.

EIA is a planning and management tool that will help government decision-makers, the project proponent and affected communities or groups decide whether the positive consequences or benefits of the project will outweigh the negative consequences or risks. These consequences can be classified as biophysical and ecological, geophysical, socioeconomic, cultural and human health impacts.

EIA will aslo identify alternatives and measures which can prevent, minimize or alleviate the adverse consequences of the project in all its stages from construction, operation, closing to rehabilitation after the project has ended. It will also provide sufficient options for the project to be continued with assurance that the quality of the environment and well-being of the people will be safeguarded.

In brief, EIA has the following objectives:

- To identify adverse environmental problems that may be expected to occur;
- To identify environmental benefits and constraints of the project as well as its economic and environmental acceptability to the community;
- To identify critical environmental problems, which require further studies and/or monitoring;
- To examine and select the optimal alternative from the various relevant options available;
- To incorporate appropriate mitigation measures into the development process; and
- To involve the public in the decision-making process related to the environment and social settings.

The initial letters **E**, **I** and **A** also describe three important attributes of the EIA process:

EARLY: EIA begins at the interception of development planning to identify opportunities and constraints in natural systems and thus guide the design of projects.

INTEGRATED: EIA is linked directly to engineering and economic studies, not performed separately or at a later time.

ALWAYS: The EIA process continues to accumulate data throughout the project cycle, monitoring the implementation of environmental protection measures and suggesting mid-course corrections to management.

Typical reasons why EIAs are required for tourism development are depicted in Figures 19 and 20. Because coastal shoreline areas are sensitive environmental features, it is easy to disrupt nature and cause permanent damage and change without proper planning, analysis and monitoring.

EIA is done by the project proponent — the agency, business firm or organization that wants to pursue a project that falls within the EIS System.

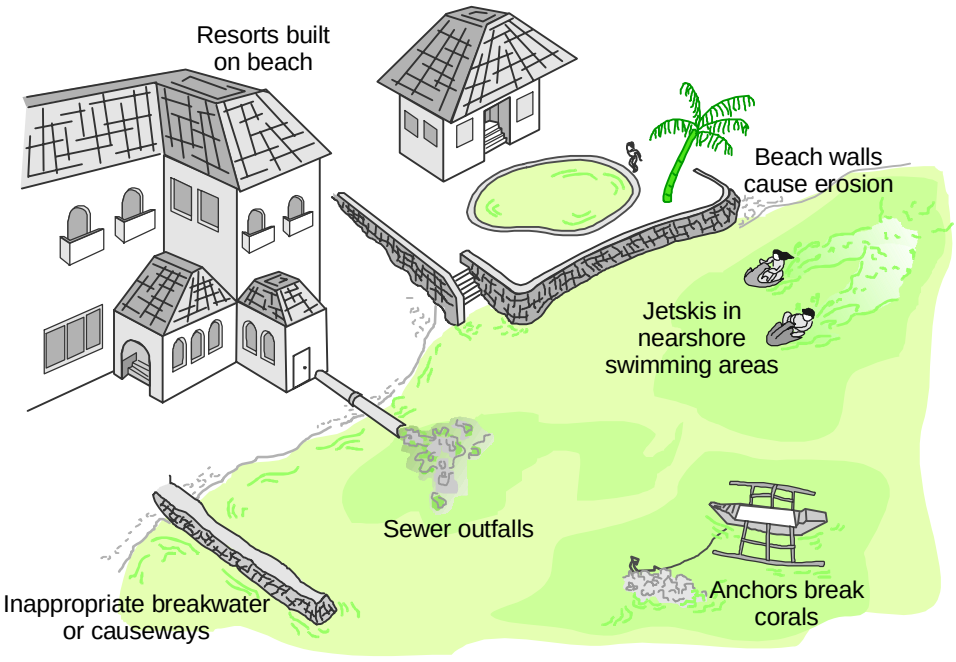


Figure 19: Frequent environmental impacts of tourism activities on the coastal zone (DENR *et al.* 2001)

GUIDELINES FOR THE EIS SYSTEM FROM THE DENR

What is Environmental Impact Assessment or EIA?

Department Administrative Order (DAO) No. 96-37 (1996) defines EIA and who is responsible to do it. This EIA process and procedures are explained in a booklet published by the DENR titled: *Our Stake in the Future: A Primer on the EIS System and DENR Administrative Order No. 96-37* (DENR 1996). The discussion herein is a brief summary of this DENR booklet.

The Initial Environmental Examination (IEE)

The Initial Environmental Examination (IEE) is the document required of proponents describing the environmental impact of, and mitigation and enhancement measures for, the projects or undertakings located in ECAs.

Regional DENR personnel are in charge of processing and receiving an IEE. The Regional Executive Director (RED) has the authority to approve or not the IEE and determines whether a full EIA and EIS are required to obtain an ECC before the development can proceed. The RED will want to ensure that the project is environmentally and socially sound. It is best for the proponent and the DENR Regional Office to discuss the project plan first informally and determine if only an IEE or a full EIS is required.

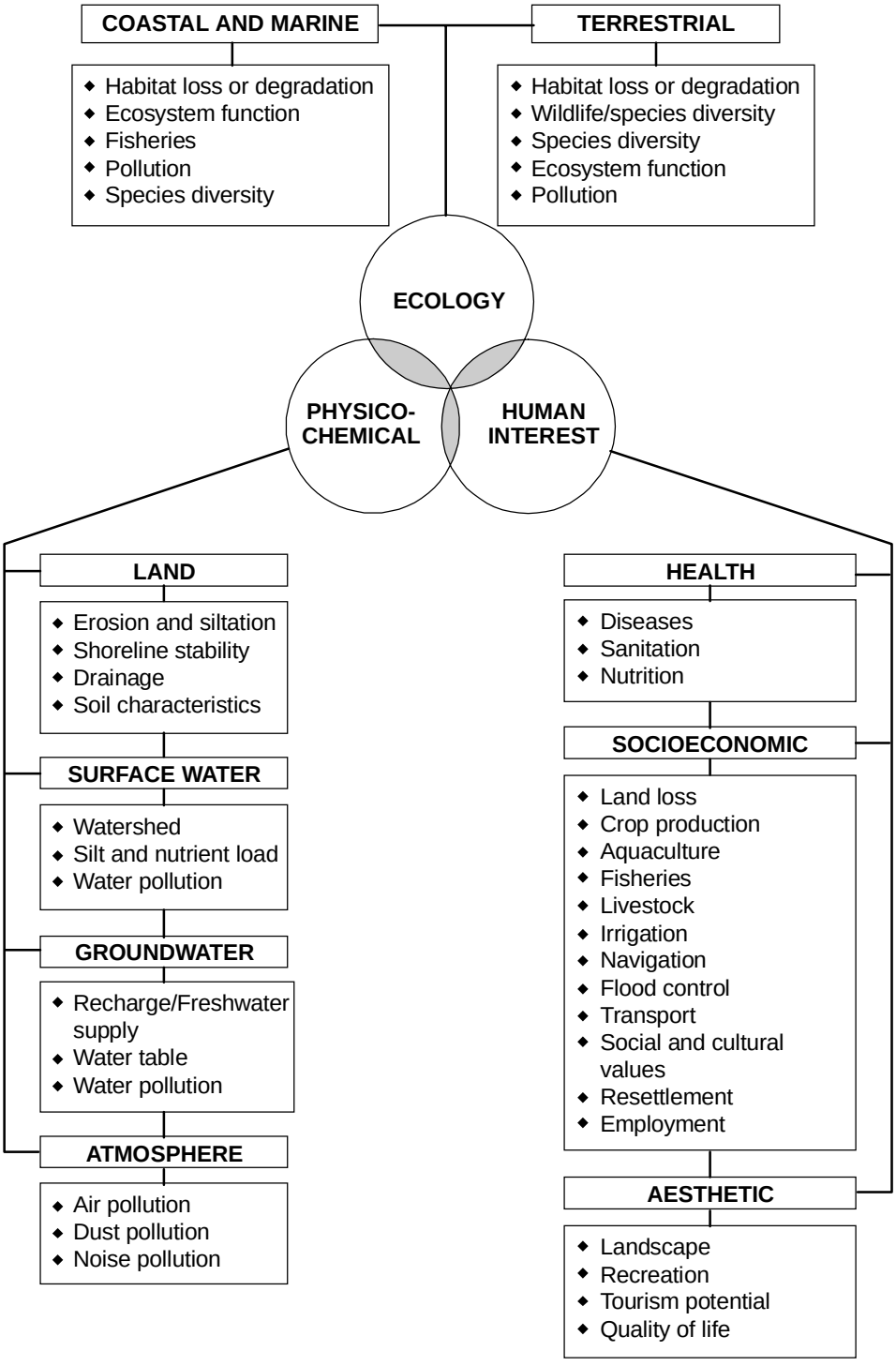


Figure 20: Types of impacts that should be considered in the EIA (Clark 1996)

The IEE is in the form of a checklist which contains questions concerning type, size and proposed environmental management of the planned project. The project proponent completes the checklist and returns it to the DENR Regional Office for review and verification. If no major impacts are expected, the DENR will issue an ECC for the project. In other cases, the DENR Regional Office will decide if the project would require a full EIA, for instance, when located in an identified critical environmental area like a marine reserve or a shoreline area with valuable ecosystems. However, these decisions are presently made on a case-by-case basis. There is no general guideline in terms of numbers of rooms or area size of tourism facilities, which would require a full EIA.

The Environmental Impact Statement (EIS)

An Environmental Impact Statement (EIS) is the document on the environmental impact of a project, including the discussions on direct and indirect consequences upon human welfare and ecological and environmental integrity. It contains the assessment of the most likely impact of the project on the environment and on the people in areas to be affected by the project. More importantly, the EIS provides an Environmental Management Plan (EMP), which specifies measures to prevent or minimize damage and alleviate the foreseen negative effects of the project on the natural environment or on the lives of people around it. The major sections of the EIS are listed in Table 21.

Table 21. Contents of an EIS

1. **Project description:** Project information, location, rationale, alternatives and phases of implementation (from pre-operational, operational up to abandonment phase)
2. **Baseline environmental conditions** for land, air, water and people
3. **Impact assessment and mitigation:** Identification, prediction and evaluation of impact; an analysis of future environmental conditions with and without the project
4. **Environmental Management Plan:** Measures for mitigation and enhancement: environmental monitoring IEC; institutional arrangements and costs to implement the plan
5. **Proposal for an Environmental Monitoring Fund** and if required, an Environmental Guarantee Fund.

Attachments or Annexes: List of EIS preparers; Accountability Statements of EIS preparers and proponent; process documentation reports; maps and photos of project site and impact areas

Specific chapters in the EIS as well as in the EMP should include the impact of the project on:

- Indigenous people, if the project is located in ancestral lands or domains of those people and affects their lives and culture;
- Women and consideration of gender issue, such as women's access to the land, water and fuel to meet their families' basic needs; and
- Population and its relationship with the resources, development and environment, for instance, if a significant increase in population will put pressure on the resources.

The review process for an IEE, EIA and EIA is outlined in the booklet published by DENR (1996) and outlined in Figures 21 and 22. A key factor in the process is the timely communication between the project proponent and the DENR Regional Office and personnel. The project proponent should at all times try to meet the requirements of a good EIS in a sincere effort to minimize impact on the environment and social conditions of the area of concern. The project proponent or any of the stakeholders may appeal the decision of the DENR Regional Executive Director, in granting or denying an ECC for a project. The person or group filing the appeal should make the appeal to the DENR Secretary within 15 days from the receipt of the decision. The DENR Secretary's decision on the appeal is final and can be immediately enforced.

Monitoring of compliance with ECC and of environmental impacts

When a project begins implementation or construction, the Environmental Management Plan approved as part of the ECC is monitored for compliance. For a project granted an ECC based on an EIS, a Multi-Partite Monitoring Team (MMT) should be formed soon after the project's ECC is issued, in time for the project startup. The functions of the MMT are generally to:

- Monitor project compliance with the EMP and conditions in the ECC;
- Gather information if damage occurs or public complaints are raised about the project;
- Prepare and disseminate monitoring reports and submit recommendations to the DENR; and
- Conduct relevant community information and education campaigns regarding the project and its impact on the environment.

The core members of the MMT are: the project proponent; affected communities and women, through their designated representatives; the relevant LGUs (*barangay*, municipal, or provincial); the DENR Provincial and/or Community Environment and Natural Resources Officers (PENROs/CENROs) in the project areas. Other members may be identified during MMT formation. The DENR Regional Office and the Environmental Management Bureau (EMB) will provide support to the MMT in technical aspects of evaluation and policy monitoring.

Participation of stakeholders within the EIA System

The primary means of public and stakeholder participation in the EIA System are:

- Public consultations are held to allow free and open exchange of information and discussion by the proponent and stakeholders. This is important during scoping and during the EIA study and planning stages.
- Public hearings are required if the project affects a great number of people, if there is mounting concern or opposition to the project, or if there is a request from any stakeholder. This is facilitated by a hearing officer designated by DENR.
- Alternative dispute or conflict resolution processes are used if there are complex issues between the proponent and other stakeholders that remain unresolved and stall the completion of the EIS, or hinder the determination of social

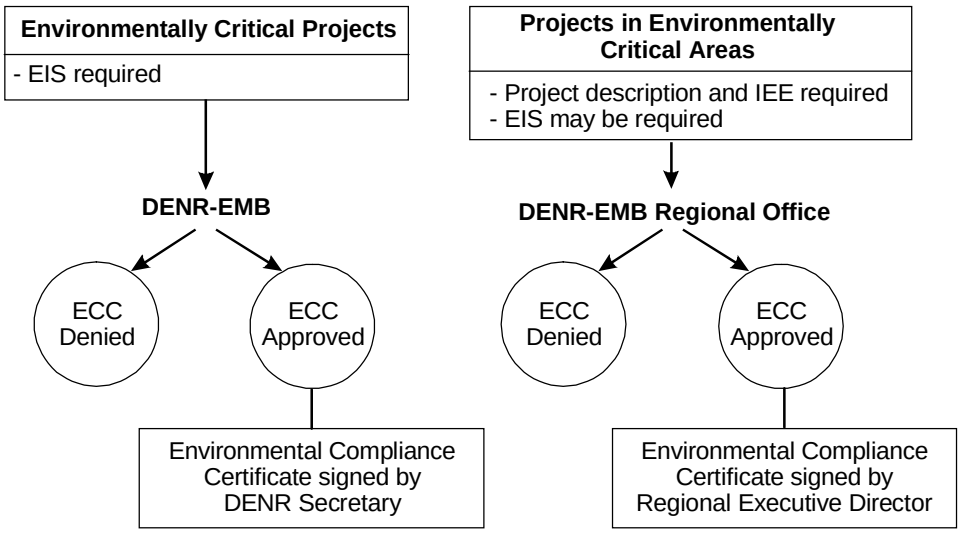


Figure 21: Overview of national EIS System (DENR *et al.* 2001)

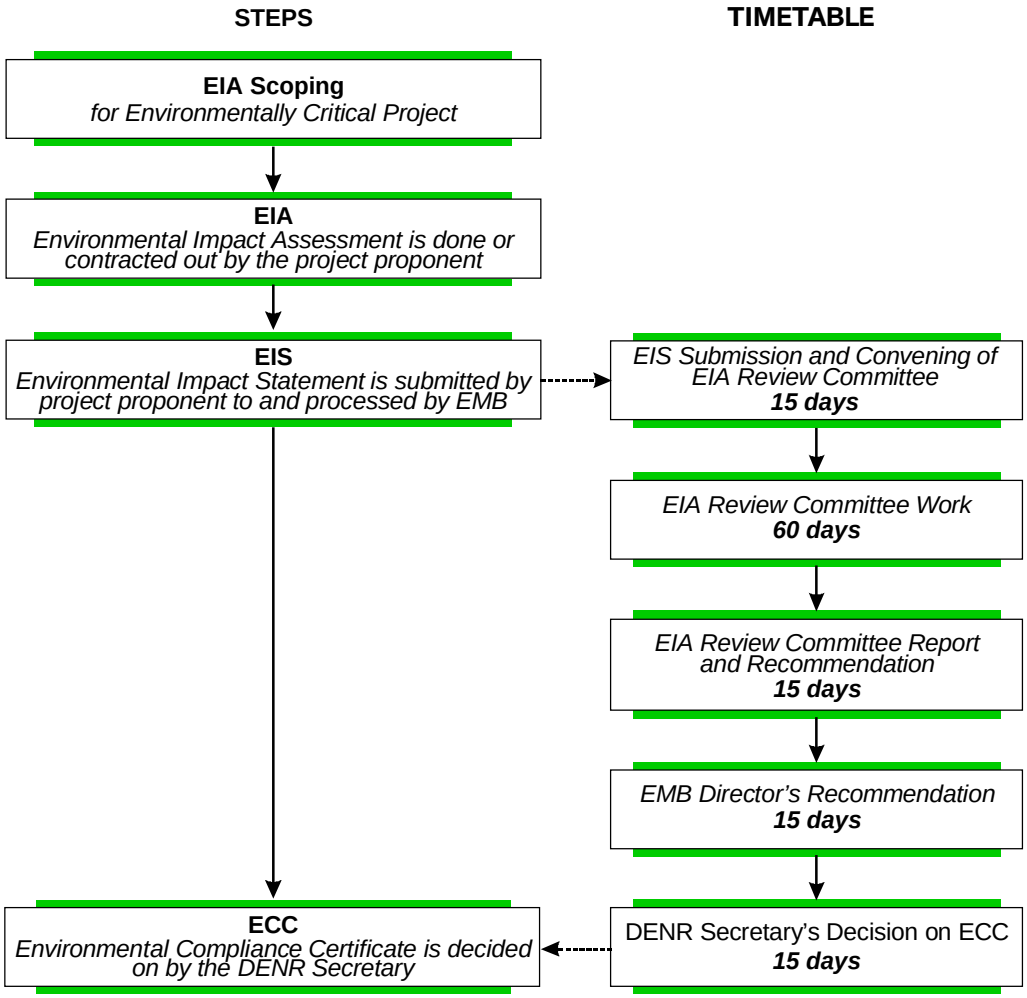


Figure 22: Steps and timetable for review of Environmentally Critical Projects (DENR *et al.* 2001)

acceptability. Mediation, negotiation or similar methods may be used to come to a consensus on key issues.

- Public information is essential for public participation. A public notice of submission of the EIS or IEE should be posted by the proponent in a conspicuous place in the *barangay* and municipal halls of affected communities. The stakeholders and public are also notified of any consultations or other meetings regarding the project. Information about the project should be presented to communities in local language. The proponents must cover costs.

The stakeholders are comprised of people and communities living or working in areas affected by a project. Those most likely to be affected are the first ones to be consulted about the project's impact on their lives. Appropriate attention should be given to the concerns of indigenous people and women. Through their designated representatives, they should be able to take part in the decision-making process of the project. Stakeholders of a project also include: LGUs where the project is located up to the *barangay* level; social institutions, like churches and schools; other government agencies and business entities operating there; NGOs and POs working in the area; and other groups that evidently will be affected by the project.

LGUs aim to protect their constituents and the natural resources of their geographical jurisdiction. They can, therefore, fulfill key roles by:

- Helping DENR to disseminate information and implement the EIS System and to encourage compliance in minimizing impacts from development projects;
- Helping to bring together the stakeholders among their constituents to participate in the EIS scoping, consultations or other processes in ensuring the project's environmental and social acceptability; and
- Participating as a member of the MMT for specific projects.

Social Impact Assessment

In addition to environmental factors, impact assessment should also include an analysis of the potential social impacts and mitigation options, either as part of the EIA, or in a separate Social Impact Assessment (SIA), conducted simultaneously with the EIA. Anticipating and addressing the potential social impacts in surrounding communities is equally important to the success of a resort development as mitigating environmental threats. Key points in SIA are:

- Discuss with local stakeholders and experts to ensure that they get an opportunity to review the development program and the expected results and benefits;
- Collect demographic data of the surrounding communities together with the earning structures before tourism development;
- Evaluate impacts on existing land-uses and cultural traditions; and
- Determine potential secondary and tertiary environmental and social impacts and their significance. Often secondary impacts like intense migration to newly accessible areas can cause more severe environmental and social problems and conflicts than the direct impacts from resort development.

Social acceptability is not a simple "yes" or "no" vote for the project by which majority wins. It is a resolution of all valid concerns regarding the project, which is done through a series of dialogues, information and negotiation among stakeholders.

If the project is socially acceptable, agreements should be made on what economic and social benefits should go to the communities through their local governments or organizations, to the *barangay* level. Other agreements on environmental protection and just compensation in case of damages should also be reached. All these should be made formal through a document, such as a Memorandum of Agreement, which is submitted, as part of the EIS/IEE.

Concrete measures and documentation of social acceptability should be included in the EIS/IEE. These may include: perception surveys in socioeconomic impact analysis, process documentation of consultations and hearing, resolutions by LGUs, and POs supporting the project, the social development program in the EMP, or other negotiated agreements reached among the proponent and other stakeholders.

Coral reefs are considered environmentally critical areas. These groins were built contrary to laws controlling foreshore development and those protecting coral reefs.

Violations of the EIA System and DAO 96-37

An Environmentally Critical Project (ECP) or a project located in an Environmentally Critical Area (ECA) must obtain an ECC or it can be immediately stopped. A Cease and Desist Order can be issued and put into effect by the EMB Director or the Regional Executive Director.

If the project has an ECC but violates its conditions, the EMP, or the rules and regulations of the EIS System, its operations may also be stopped and its ECC may be canceled or suspended.

Proponents or EIS/IEE preparers involved in misrepresentation in the documents or other presentations, or who commit other infractions of DAO 96-37 or other relevant laws and orders are in violation of their Accountability Statement and are subject to sanctions.

Environmental Impact Statement checklist for coastal resorts

In the Philippines as in other countries of the region, the legislation for EIA is in place. However, the implementation and enforcement is still weak. In 1997, only 4 out of 54 coastal resorts and hotels on Mactan Island, Cebu, had completed the EIA and were granted the ECC. Many environmental problems have arisen from this situation.

For the parties involved in construction and operation of coastal resorts, environmental management and environmental monitoring plans are critical. These plans provide guidance as to how adverse environmental impacts can be avoided or mitigated during the construction and operation of a resort. Hence, the format of the EIS should help these people to do a good job with practical and easy-to-implement

recommendations. Although professionals are normally approved by DENR to prepare an EIS, in many cases the quality of the EIS may vary and be too wordy, non-specific or overly academic.

Local and regional DENR officials, as well as the project proponents, can use the user-friendly guidelines for drafting an EIS shown in Table 22. These are particularly helpful for the environmental management and monitoring measures. It is important that mitigating measures are described in detail so they can easily be implemented by the construction personnel (Figure 23 and Table 23). A coastal tourism impact network is shown in Figure 24 that highlights the interconnections among tourism impacts, quality of environment and the ultimate tourism demand for an area.

Table 22. Checklist for good-practice EIS

- Most crucial and practical environmental management and monitoring measures are tailor-made to suit site-specific conditions.
- Avoid general statements on management measures like "*Runoff should be prevented*". Describe how this should be done.
- Structure EIS documents, especially EMPs, following the sequence of development activities (e.g. land-use planning, land clearing, grading, drainage works, building construction, landscaping, operations). In this way, it becomes more relevant to the practitioners as they can easily refer to the work phase they are dealing with at any time of the development process.
- Present information on environmental management practices in a visually accessible manner wherever possible with sketches, typical cross sections, dimensions and design details (see example in Figure 23).
- Use simple language for easy understanding by implementing agencies such as construction contractors.
- Identify clearly the implementing agencies and responsibilities.
- Quantify environmental management measures for costing purposes. If no budgets are allocated for mitigation measures (e.g. silt traps and fences, etc.), the contractors may not be able to implement them. Include environmental budgets in all awarded works contracts.
- Provide exact location details of areas allocated for measures. Simple maps make it easy to find the locations for management measures.

Source: Hüttche (1999a)

Visualize environmental mitigation measures in EIS

In this graphic, revegetation of slopes and drains are visualized to provide details on location, purpose and method of the measure.

An existing project engineering drawing has been used to add the information.

A practical EIS contains several of these drawings for all key mitigation measures.

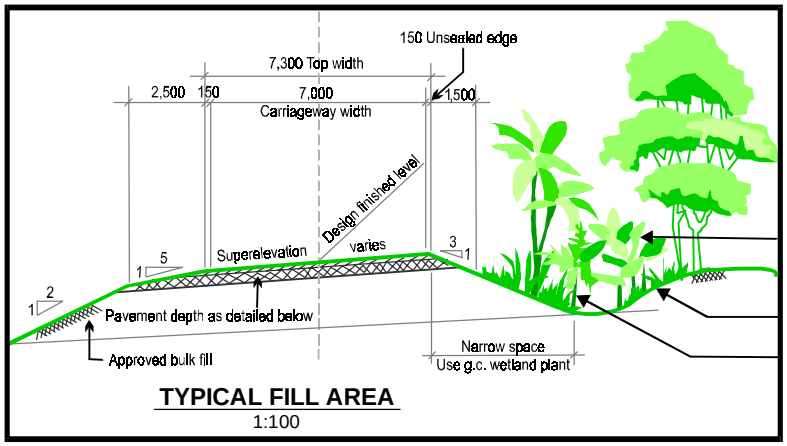


Figure 23: Example of how environmental mitigation measures and management plans can be graphically enhanced to assist with implementation (Hüttche (1999a)

Table 23. An overview of often-cited environmental impacts in the context of coastal tourism and mitigation measures

Potential negative impacts	Mitigating measures
DIRECT	
Beach mining of sand for construction. Destruction of reef for aggregate materials used in construction.	• Control of construction contractor • Submission of plans in accordance with local ordinances on beach sand mining
Destruction of wetlands, forests, other unique/sensitive habitats or cultural, historical and archaeologically important sites.	• Areas considered for development should have zoning plans to account for natural geographic and socioeconomic conditions • Base development phase on an inventory of resources
Erosion resulting from uncontrolled clearing, infrastructure construction such as roads and marinas.	• Develop erosion and sediment control plans
Loss of "free" environmental services from natural systems and degradation of air, water, land resources.	• Carrying capacity should be defined so that target tourist population can be sustained without overburdening existing infrastructure and resources
Water pollution from inappropriate sewage or solid waste disposal. • marine effluent disposal • residential sewage disposal • marinas • infiltration to groundwater	• Allowance made for use of existing municipal or regional collection and disposal system or construction of on-site sewage treatment plant • Liquid waste should not be discharged onto beaches, coral reefs, or other sensitive areas • Verify local capacity to monitor and enforce pollution regulations
Solid and liquid waste disposal creates nuisance conditions adjacent to amenities.	• Appropriate waste disposal options required to manage potential problem

(continued)

Table 23. (continued)

Potential negative impacts	Mitigating measures
	• Landfill versus incineration alternatives, as well as waste minimization will be considered
Access problems created • traffic congestion and noise • minor and localized air pollution • people density greater or too high	• Access problems minimized by integrated planning to reduce traffic and pedestrian congestion, noise
Sea turtle nesting affected (special case)	• Beach monitoring for turtle protection coupled with beach zoning and development guidelines to preserve the natural beach environment from the primary dune seaward • Restricting night activities and lights on nesting beaches during egg-laying and incubation periods
Displacement of human population	• Plan and implement program of compensation and resettlement • Offer guidance for people in their newly resettled area
INDIRECT	
Conflicts with other resource use such as fisheries, agriculture	• Conceive tourism development in framework of national, regional, local socioeconomic development plans to integrate new objectives into development strategies • Identify zones most suitable for tourism
Beyond capacity to manage the "tourist or related environment" • legislation and polling constraints • agency support lacking • staffing and financial resources to mitigate impacts absent/reduced • inadequate training in environmental management	• Comprehensive legislative action frequently required to address direct and indirect impacts and their monitoring and evaluation • Staffing and equipment support must be budgeted, including whatever training necessary to mitigate impacts and monitor the "environmental protection plan" or other mitigation plan
Multiplier effect on other industries causes increased stress on natural resources or services (craft market, vendor, taxi driver, suppliers, farmers/fishermen).	• Provide adequate infrastructure and support to meet physical, social and economic needs of the region • Recognize that "overbuilding" may be a persistent problem
Congestion, overcrowding	• Design (urban areas and transport networks, etc.) according to carrying capacity of natural setting
Natural hazards peculiar to developed site such as coastal storms, flooding, landslides, earthquakes, hurricanes, volcanoes may stress infrastructure and reduce long-term benefits	• Design facilities to (a) meet best possible specification for natural hazard amelioration; (b) take advantage of natural resources such as wetlands ability to buffer storms or absorb treated wastewater

Source: Adapted from Sullivan *et al.* (1995)

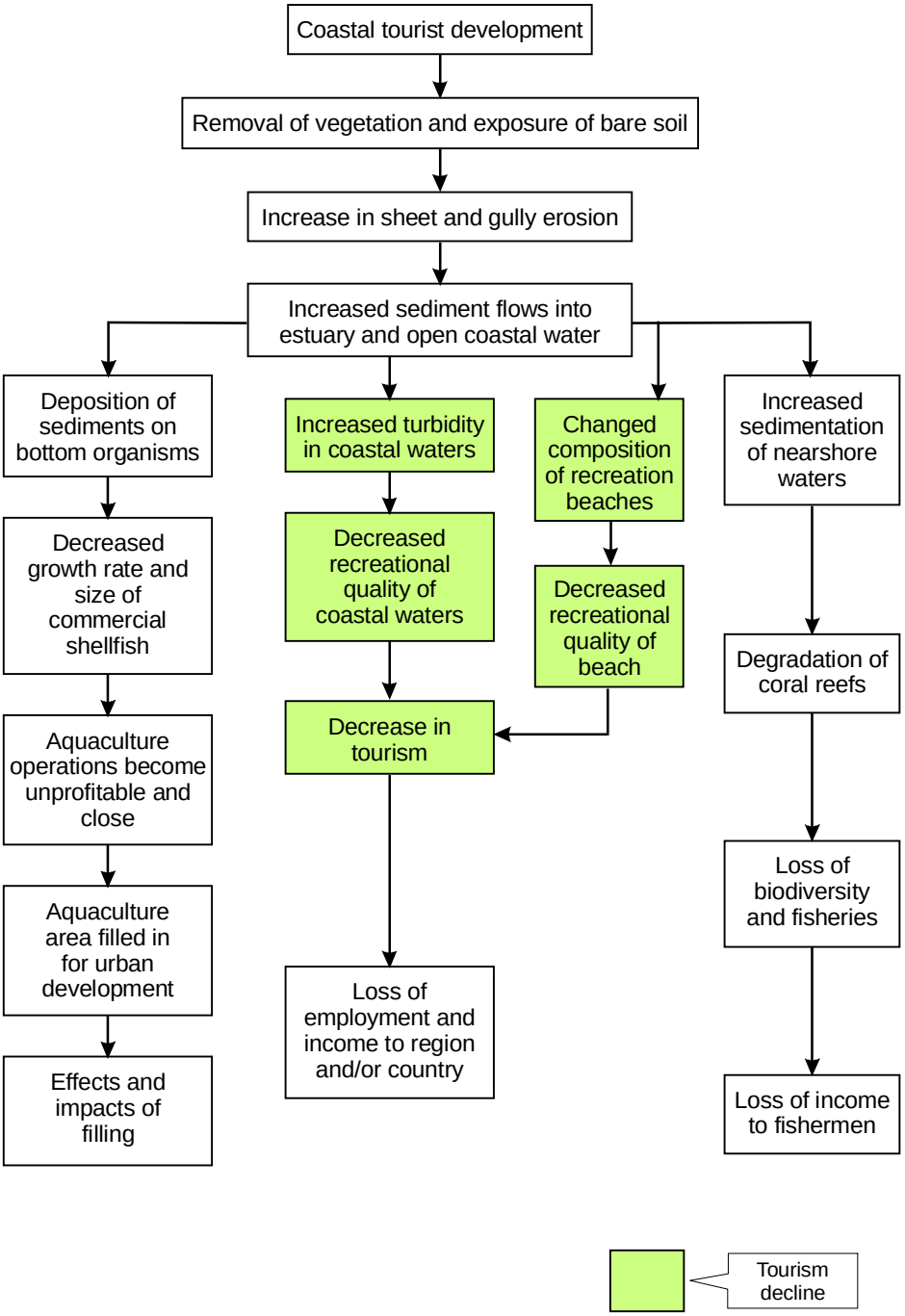


Figure 24: Example of a coastal tourism impact network with direct and indirect impacts (Sorensen and West 1992)

Feasibility of EIA Process for Small-scale Resorts

Undertaking the EIA is a lengthy and expensive process. Small-scale resorts may not have the resources to conduct the activity. However, this process is important since even a small-scale project can wreak havoc on fragile ecosystems. For instance, female sea turtles dependent on a particular beach to lay their eggs could be disturbed by the presence of small resorts.

In reality, small resorts are springing up like mushrooms in popular coastal destinations in the tropics of course unchecked. Individually, they may not pose a large threat to the coastal environment, but in a dense cluster development of small resorts, their environmental impacts are accumulated. These cumulative impacts are a loophole in the EIA legislation in the Philippines and elsewhere and must be addressed by proactive planning and negotiation of local governments and organizations.

In addition, smaller resorts might not have the financial capacity and technical know-how to implement modern environmental technologies. Their performance standards per unit are usually lower compared to a unit of the same size of a large resort. An example is sewage treatment. In small resorts, no or only simple technologies like septic systems are used for treatment purposes. The results can be observed in coastal tourism destinations such as Boracay Island or Puerto Galera, Mindoro Oriental. Insufficiently treated sewage from numerous small resorts accumulates, flows directly or leaches through the ground into the coastal waters. The effects include: unhealthy bacteria levels, algal blooms, odor problems and unsightly beaches.

Local municipal, city and provincial governments need to be alert and proactive to address these issues. EIA is one tool to address these problems and serve as a planning and management instrument when conducted for areas at the scale of one or more *barangays*. These combined EIAs can produce mini-masterplans or EMPs based on the EIA findings. They can serve as local area environmental management plans and set the stage for guidelines on development for an area of concern. The format may be reviewed and simplified where possible to facilitate the EIA process and its implementation to make it more efficient for small-scale resorts.

A combined EIA and SIA can clearly address cumulative impacts and can offer integrated and shared environmental management solutions. For instance, several small-scale resorts can be connected to treat their sewage in a small modular treatment, where costs can be shared. *Barangay*-level EIAs should encourage the participation of community members, as they will be the ones to implement and live with the EIA recommendations. Ultimately, planning at the *barangay* and municipal or city levels to prevent the negative impacts of tourism development can follow the process elaborated in Chapter 2 on ICM planning and implementation.

Case Study: Malaysia and Batangas

Conducting a thorough EIA is not enough; the study's recommendations must be followed. Some developers regard the EIA as an administrative hurdle. Once the EIA has been submitted and approved by the authorities, EIA implementation is not seen as adding value to the projects. The following examples showcase this problem.

CASE STUDY: Pulau Redang, Malaysia and Nasugbu, Batangas

Before development on the island of Pulau Redang, Malaysia, an EIA predicted that major resort development would result in the depletion of freshwater supplies, slope erosion and the destruction of the surrounding coral reef (marine park). Although the EIA recommended significantly limiting development and placing restrictions on building in steep areas, these recommendations were ignored and major resorts were developed, not surprisingly causing the predicted impacts. Freshwater resources on the island have been overused, resulting in saltwater intrusion and contamination and forcing the government to propose an expensive water pipeline from the mainland to meet tourists' needs (see also Boracay Island). Furthermore, slope erosion has destroyed terrestrial ecosystems and choked the surrounding reef, resulting in significant species loss, the clouding of previously clear waters and a decline in the quality of the tourism product (Manning and Dougherty 1994).

Another case shows that a public discussion on EIA is important for enforcement. In 1996, a Philippine property developer started with the development of a large-scale integrated coastal resort near the coastal town of Nasugbu, Batangas Province. The company hired advisers to address relevant environmental aspects and to prepare the EIA, but failed to secure an ECC before construction began. Large projects like this are often driven by tight schedules since they represent millions of investment dollars. The issue of the missing ECC was publicized in local newspapers at that time, together with reports about pollution of coastal waters in the project area due to poor clearing practices. This led to a temporary suspension of construction until these issues were clarified. Thus, public scrutiny of projects with adverse environmental and social impacts is an important element of the EIA process.

Minimizing Environmental Impacts in Protected Areas

All protected areas are required by the NIPAS Act to have a management plan that guides its development and uses within the area. Such management plan often includes quite specific guidelines to prevent negative impacts. An example of allowable activities within specified zones for the Turtle Islands, Tawi-Tawi is shown in Table 24.

Table 24. Activities allowed or restricted in the Turtle Islands Heritage Protected Area

Activities	RZ	HMZ	SPZ
Access			
Paddle boats	Yes	Yes	Yes
Motorized boats	Yes	Yes	No
Cruise boats	Restricted	Restricted	No
Anchoring/mooring buoys	Restricted	Restricted	No
Tourism Activities			
Turtle nesting watching	Yes	No	No
Bird watching	Yes	Yes	No
Nature appreciation	Yes	Yes	No
Volcano exploration	Yes	Yes	N/A
Daytime photography	Yes	Yes	No
Nighttime photography	Restricted	No	No
Picnicking	Yes	Restricted	No
Island hopping	Yes	Restricted	No
SCUBA diving	Yes	Restricted	No
Snorkeling	Yes	Yes	No
Swimming	Yes	Yes	No
Rowing/kayaking	Yes	Yes	No
Wind surfing/hobiecat	Yes	No	No
Infrastructure Development			
Restaurant	Yes	Restricted	No
Single-level cottages	Yes	No	No
Souvenir shops	Yes	Restricted	No
Comfort stations/restrooms	Yes	Restricted	No
Visitor information center	Yes	Yes	No
Improvement of airstrip	Yes	No	No
Solid waste disposal system	Yes	Restricted	No
Sewage treatment facilities	Yes	Yes	No
Jetties	Restricted	Restricted	No
Observation decks	Yes	Restricted	No
Trails	Yes	Restricted	No
Interpretive signs	Yes	Restricted	No

RZ - Recreation Zone; HMZ - Habitat Management Zone; SPZ - Strict Management Zone

Source: DENR AO No. 99-31

SUMMARY

It is important that small locally managed and medium-scale coastal resorts are active in planning to prevent the negative impacts of their presence. Although it is in their interest to do so since their business often depends on a clean and healthy coastal environment, they may lack the expertise, knowledge and financial resources to minimize impacts in the most effective way possible. Thus, LGUs can play an important role in facilitating the planning and mitigation process and the EIA process can be modified to accommodate the planning and prevention needs of the smaller-scale tourism operations. Large resort developments should follow the full intent of the EIA requirements of DENR and in coordination with local government.

CHAPTER 7

Site Use and Design

Sustainable design is not a reworking of conventional approaches and technologies, but a fundamental change in thinking and in ways of operating—you can't put spots on an elephant and call it a cheetah.
-C. Franklin (1993)

Planning and development in coastal areas is often not sufficiently systematic, thus leading to environmental decline. Voluntary measures by private developers and individuals are necessary to change this pattern. This will result in the preservation of the scenic and natural attractions of the coastal zone. This chapter outlines the considerations that tourist developers should make when planning to use a site within the coastal zone and is consistent with guidelines endorsed by the Department of Tourism (UNDP/WTO/DOT 1991).

With better planning and integration with the community, overall socioeconomic benefits from natural resources will increase and last much longer.

Selecting Suitable Sites with Environmental Considerations in Mind

Physical location and design of coastal tourism projects go hand in hand with the EIA process, described in Chapter 6. EIA delivers the necessary data on natural resources and the site's potentials and constraints to facilitate the location and design of buildings and facilities. In general, a site should be maintained in its original state as much as possible by locating all buildings with the least environmental impacts possible. Extensive re-shaping of land and alienated designs should be avoided. The benefits of this approach are both aesthetic and economic. Costs can be reduced dramatically by considering physical and geographic features when planning developments.

Utilizing existing natural coastal systems and conditions can, for example, reduce reliance on electric cooling systems and water pumps. Less investment and ground maintenance will be necessary if existing vegetation is kept intact.

Existing coastal geomorphology and the physical attributes and features of the coastal zone are of great importance for the selection of a suitable resort site. Knowing and recognizing some coastal geomorphological features and trends is important for both the short-term and the long-term development of the resort. For example, if the potential coastal erosion is known, a setback or buffer zone can be incorporated in the placement of the resort.

Research on Malaysia's east coast has produced a classification guide of beach resort sites as a reference for the identification of potential resort sites (Figure 25).

Recommendation for resort sites for the classification shown in Figure 25

Picture A Zetaform bay, where a resort is best located in the protected northern curve and away from the river mouth. Other possible locations including the exposed southern sector are along the length of the bay but all should be away from river mouths.

Picture B Non-zetaform bay, where the best location is usually in the center of the bay as both ends of the bay are subject to marked seasonal beach changes.

Picture C Coastal barrier, where the beach resort is best located landward of the lagoon (seasonal channel) separating the barrier from the mainland.

Picture D Low linear coast, where the preferred location is away from any coastal erosion and river mouth.

Picture E Estuary, where the preferred location is above the flood level and away from the changes attendant with spit formation.

Besides beaches, there are many other types of coasts and elements to be considered for an environmentally sensitive resort site location. Seasonal monsoons and storm waves are important factors (see Shoreline setbacks), and the effects of the resort on the surrounding environment have to be anticipated (Bird 1969; Bascom 1980).

In the resort design practice, environmental zoning provides clear guidance for the selection of building sites. A simple system is illustrated in Figure 26 and operates as follows:

- All identified coastal resources are classified in zones of impacts with zone 1 being the most sensitive to disturbances and zone 3 the least sensitive. This serves to identify and demarcate environmentally sensitive areas as context for the proposed development.
- Environmentally sensitive areas are designated as coastal buffer zones or "greenbelts". A classification guide used for the zoning is presented in Table 25.

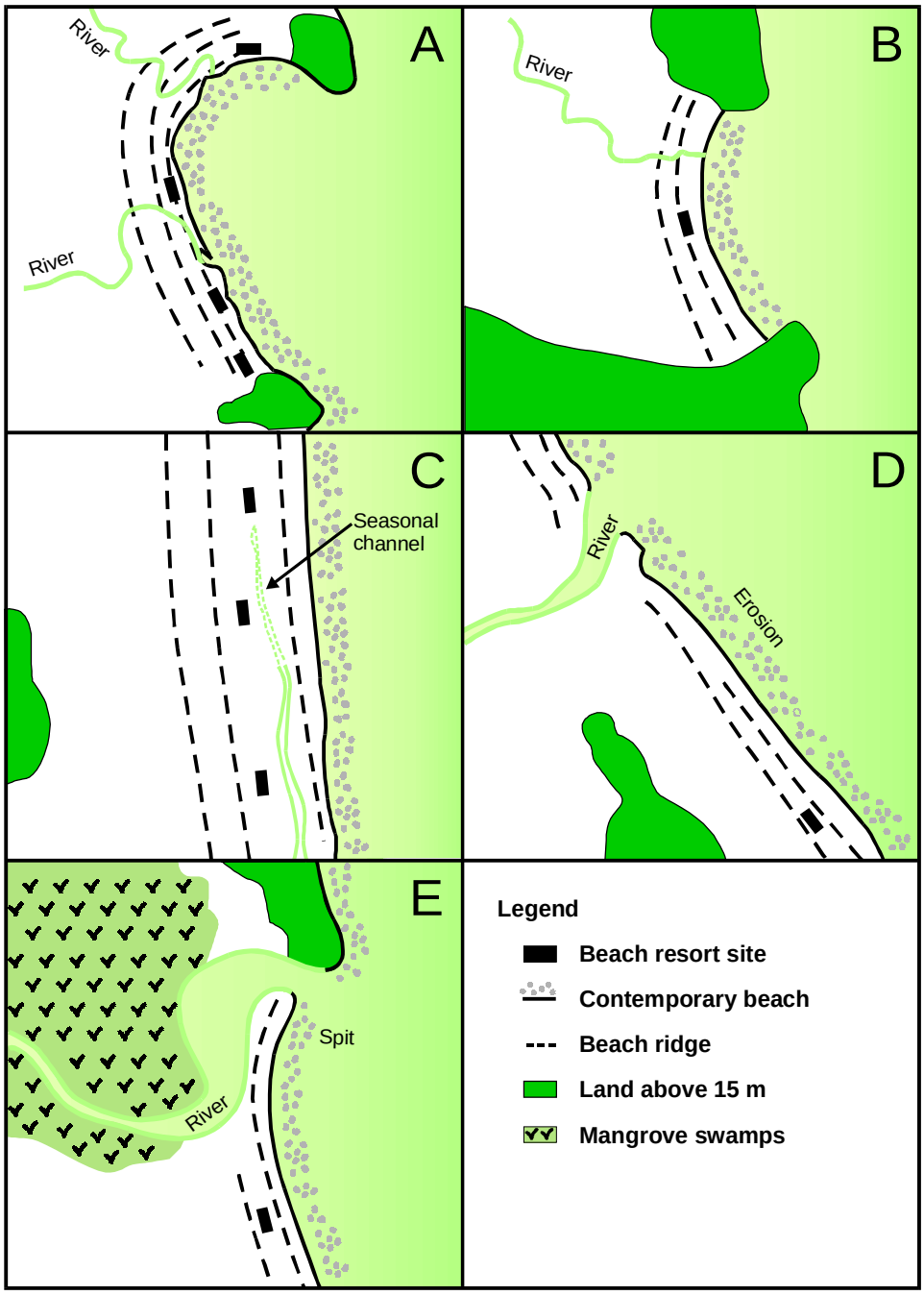
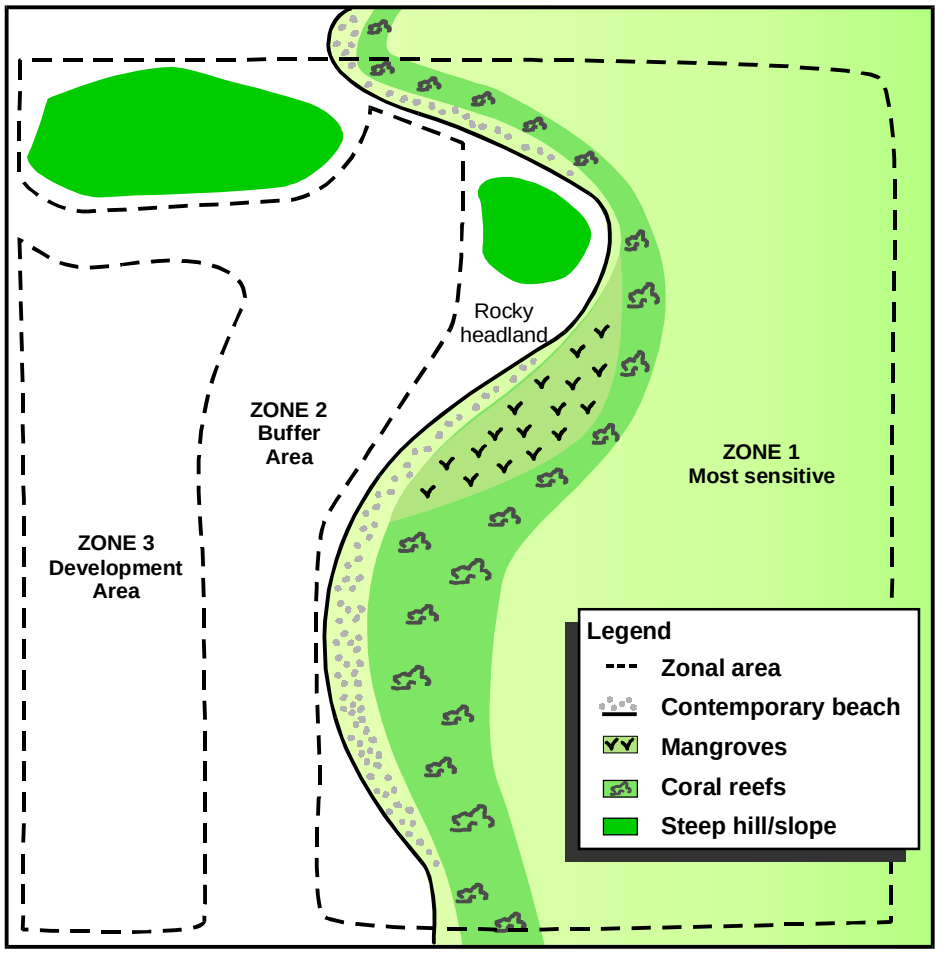


Figure 25: Classification of beach resort sites based on coastal features (Wong 1990)

- In coastal areas, zone 1 will mainly include beaches, cliffs, rocky shores, coral reef flats, mangroves, etc. If an area is classified as zone 1, certain restrictions for placement and design of buildings are imposed to maintain the buffer function of the zone.



Zone 1: Most sensitive: Critical habitats e.g. reefs, mangroves, beaches or steep slope
Zone 2: Less sensitive: Buffer between most sensitive and development area
Zone 3: Development area: Generally level areas without critical natural habitat or steep slopes

Figure 26: Zoning scheme used for minimizing resort impacts to sensitive areas

This system serves to maintain the overall environmental quality of a given site, including features such as biodiversity, drainage, water quality, slope stability and natural vegetation (Figure 26; Table 25). The distribution of the zones is based on criteria such as proximity to sea or coral reefs, slope gradient, presence of coastal vegetation and wildlife. The data can be extracted from an EIS or other source, which includes an inventory of all resources. Certain restrictions can now be developed and imposed for the development of the area. For example, no buildings should be allowed within zone 1 while those in zone 2 should be placed on stilts or columns to minimize grading and earthwork in these sensitive environments. Larger building complexes can be situated within zone 3 further away from the shoreline, leaving the other zones mainly as buffer with only small structures built.

Table 25. Guide for the classification of natural resources in zones of impacts

Impact character	Classification criteria	Zone 1	Zone 2	Zone 3
Erosion control/ water quality	Proximity to water/ sea	• 0.0 - 40.0 m	• 40.0 - 100.0 m	• >100.0 m
	Undisturbed slopes	• >25.0% slope (22.5 degrees)	• >20.0 - 25.0% slope (18.0 - 22.5 degrees)	• <20.0% slope (<18.0 degrees)
	Proximity to tributaries	• <50.0 m		• >50.0 m
Biodiversity/ habitat value	High diversity and/ or abundance of species	• excellent	• good	• moderate to poor
	Species protection status	• protected by law • endemic	• vulnerable/ rare	• no protected species
Noise	Construction noise: proximity to hospitals, local clinics, schools and religious places	• 0.0 - 50.0 m	• 50.0 - 100.0 m	• >100.0 m
	Ambient noise level during operation of road	• increase to 65 to 90 decibel (A)	• increase to below 65 decibel (A)	• no changes predicted

Source: Hüttche (1998b)

Shoreline setbacks and locating facilities away from the coast

Coastal land is a limited resource valuable for many different uses. It is imperative that any coastal development be built inland from the shoreline. Facilities for tourist resorts should be located away from the shore as much as possible. Locating these facilities on the shoreline occupies valuable space, pollutes nearshore waters with increased surface runoff, and greatly increases the chances of storm and wave damage and the ultimate loss of the beach. The negative effects of building too close to the shoreline are illustrated in Figure 27.

Setbacks and natural beach vegetation are attractive while minimizing impacts on the beach environment.

A setback is defined as an area left free of any physical modification. Setbacks are important because they allow for natural coastal processes to occur uninterrupted and ensure both physical and visual access to the coastline. The major objectives of setbacks are:

- Protecting life and property against erosion and storm surge;
- Minimizing public investment in coastal protection;
- Protecting and enhancing the scenic value of coastal environments;
- Minimizing use conflicts among various types of activities taking place in the coastal zone;
- Ensuring public access to and along the coast;
- Maintaining consistency between national and local laws and plans;
- Protecting vulnerable beaches and other habitats such as coral reefs and seagrass beds; and
- Providing buffer zones around coastal historical and traditional use areas.

By allowing seasonal or long-term changes and storm surges to occur, economic losses will be minimized as coastal structures adhering to setbacks will generally avoid most of the severe damage.

BEFORE: Moalboal beach in 1980 was very attractive and spacious.

AFTER: Moalboal beach in 2001 has been almost totally lost due to illegal building and sand mining in foreshore areas.

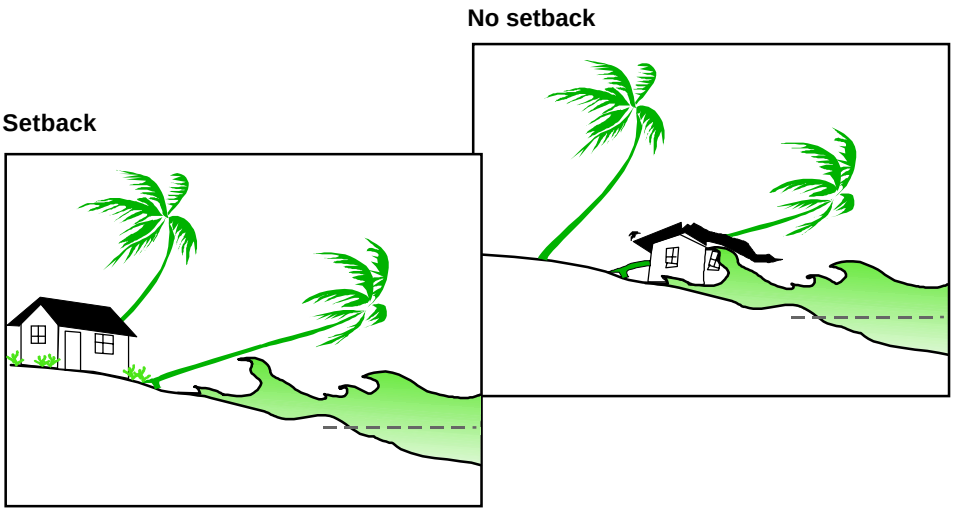


Figure 27: Effects of locating building too close to the shoreline. Potential of damage to physical structures from storm and storm waves increases when no proper setback is applied (adapted from Rees 1990)

The setback regulations for coastal areas vary from country to country. Indonesia requires a 100-m shoreline setback for all buildings from the mean high water line. Some countries like Sri Lanka allow for variable setbacks that depend on the section of coast and the rates of erosion, the type of structures to be constructed and an overall appraisal of the site and its limitations (CCD 1997).

The required easement or setback distances under Philippine law and the terminology used to describe shoreline areas are shown in Figure 28. A provision of the Water Code or PD 1067 states that "the banks of rivers and streams and the shores of the seas and lakes throughout their entire length and within a zone of 3 m in urban areas, 20 m in agricultural areas, and 40 m in forest areas, along their margins, are subject to the easement of public use in the interest of recreation, navigation, floatage, fishing, and salvage. No person shall be allowed to stay in this zone…or to build structures of any kind." Furthermore, PD 1198 requires the rehabilitation of damaged foreshore areas to their original condition. The DOT has established a minimum setback or "easement zone" for beach resorts of 30 m from the seaward edge of natural vegetation as shown in Figure 29 (UNDP/WTO/DOT 1991).

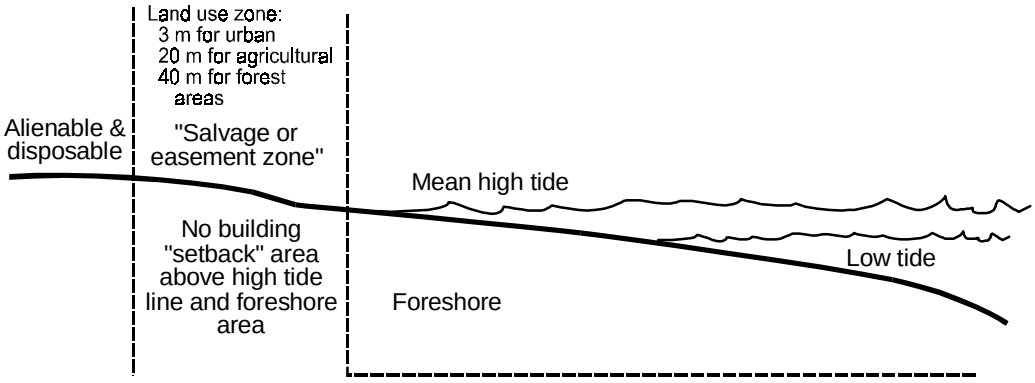


Figure 28: Coastal shoreline setback required by law in the Philippines and zones (DENR *et al.* 2001)

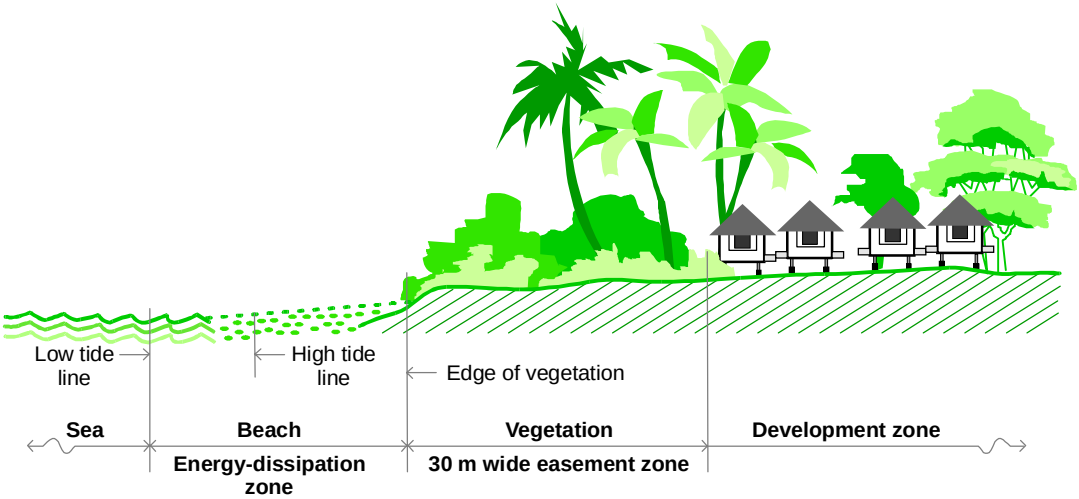


Figure 29: Setback along a beach front from edge of vegetation as stipulated by DOT (UNDP/WTO/DOT 1991)

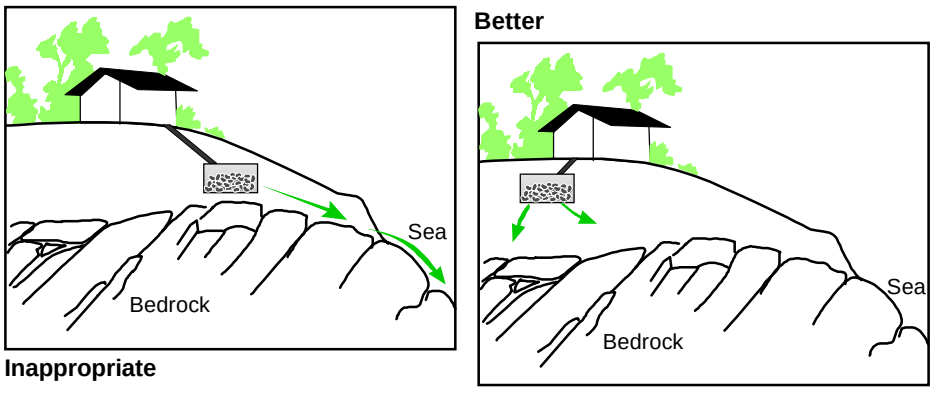
Although some tourism developers feel setbacks decrease their establishment's desirability to tourists, there are several advantages to having setbacks in place. In a resort or tourist area, the land between development and the beach can be enhanced and provide attractions to tourists. Many tourists come from countries where they have spent months indoors avoiding the cold. When they travel to the tropics, they want to spend as much time as possible outside. The beach will always be an attraction but open, landscaped spaces away from the water can be equally as appealing in providing:

- Shade from the sun and heat;
- Place for artists or photographers to work;
- Native vegetation which provides tourists an opportunity to study indigenous plants; and
- Open space to enhance the view of the coastline and ocean.

Carrying capacity of site to support facilities and amenities

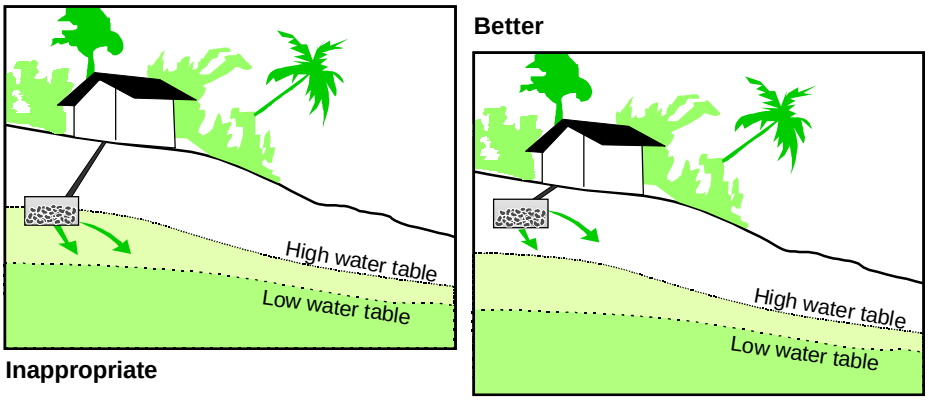
Water supply in a selected resort location is always a crucial factor in site selection. It is important to pre-determine if the proposed development area provides an adequate natural supply of fresh water or the planned resort capacity. The alternatives are expensive such as constructing a desalinization plant to convert seawater to fresh water or transporting water by truck or pipe from a distant source.

There also must be suitable space to locate important infrastructure facilities such as sewage and wastewater treatment systems to protect against fecal contamination (see Sewage disposal). Answers to these questions will depend on the EIS or a good project design (Figures 30 and 31). Considerations include placement of septic systems in relation to bedrock and seawater levels. Leaching of wastes from improperly sited septic systems contributes to temporary seawater contamination in Boracay Island and other developed shoreline areas.



Left – septic system is directly above bedrock, resulting in wastes seeping along bedrock gradient and reaching sea before proper treatment.
Right – better placement of septic system as wastes will be treated in at least 1 m of soil above bedrock. Gradient of bedrock is less steep, so effluent will not flow directly into sea.

Figure 30: Placement of septic systems for sewage treatment in relation to topography and soil structure (Rees 1990)



Left – septic system installed during dry season contaminates water supply during monsoon season.
Right – septic system built above the high water tables.

Figure 31: Septic systems must be sited with knowledge of groundwater tables during the monsoon season (Rees 1990)

Aesthetics of area and near cultural sites

Along with the regulatory considerations, design should be sensitive to the aesthetics of an area. If the development is within view of an important site or building, the tourist facility should not be taller than the site. The design of the exterior of the building should also be harmonious with the architectural style of the site.

Good design minimizes impact on the local coastal environment and is aesthetically pleasing.

For coastal resorts, a rule of thumb is to restrict height of buildings to the height of the surrounding vegetation. As many coastal areas in the Philippines and the tropics are lined with coconut palms, the height of the coconut has been used as a common measure for good aesthetics. Building height is generally measured from the finish ground elevation to the peak or highest ridge of the building roof. Another way of sustainable siting is to step buildings to reflect changes in the site's topography (Figure 32).

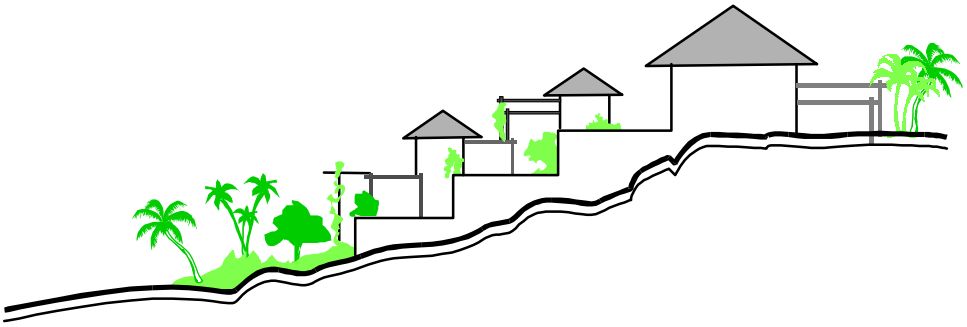


Figure 32: Staggered building form (BBIR 1996)

These considerations are particularly important in areas of cultural, archaeological, and scenic beauty, but should also be considered for any tourist development. In Bali, the construction of a resort golf course near the scenic Tana Lot Temple sparked protests from the local people and NGOs. Many believed that building close to a religious site and possibly preventing access to it, is inappropriate and disrespectful to local traditions and religious customs. On the other side, planning and design can enhance the country's natural coastal assets and protect the main tourism attractions if done in a sensitive manner. Some countries, such as the Maldives, have developed coastal tourism development criteria as in Table 26.

Consider Local Land Uses and Traditions

Social considerations when locating a tourist facility include a careful assessment of all local uses of the proposed development area, including potential ways to limit the impacts on local uses. A development project that inhibits the traditional uses of a region will most likely not be welcomed by the community, resulting in decreased living quality for local people as well as decreased vacation quality for visitors. Another social variable is determining the type of clientele expected to frequent the establishment and planning according to desired needs.

Table 26. Coastal tourism development criteria for Maldives

Strict criteria for appropriate location and design of coastal tourism developments are to:

- Limit the maximum builtup area to 20% of the total land area.
- Preserve the aesthetic integrity of resort islands by restricting the height of buildings to the height of the vegetation profile of the island. The maximum height of any building is limited to two stories provided that there is vegetation on the island to conceal these buildings.
- Allocate space for each tourist such that each tourist room should face the beach with 5 linear meters of beach line provided to each tourist in front of their room. Only 68% of the beach length can be allocated to guestrooms, 20% has to be allocated to public use and 12% left as open space.
- Preserve native vegetation through mandatory replacement of each tree that is cut down. Certain rare and large trees have to be avoided when constructing buildings.
- Ensure setbacks from the beach such that all buildings have to be located well away from the peripheral vegetation. A minimum setback distance of 5 meters from the shoreline to ensure that the peripheral vegetation, most important for coastal protection, is preserved.
- Allocate space for vegetation between buildings to ensure that substantial areas of indigenous vegetation are left untouched.
- Prevent construction of rock-filled jetties, groins, seawalls and detached and submerged breakwaters. Rather, promotion of greater coral colonization on the peripheral reefs and other natural methods to protect shorelines is encouraged.

Source: Ministry of Tourism, Maldives (1998)

Sustainable Building Design

Environment-friendly designs include, for example, designing rooms, facilities and amenities to maximize the natural ventilation from the prevailing coastal winds. External screens can be fitted and used to shade windows from direct sunlight. Ceilings can be well insulated to minimize heat transfer into rooms (Figure 33).

Utility design with renewable energies

The use of renewable energy technologies, solar, wind, water among others, is still new in the design for sustainable tourism facilities. However, the external conditions for many resorts, remote locations, unspoiled environments, lack of public infrastructure, are requiring developers to be self-sufficient in their utility design. Technologies are developing rapidly and are becoming more accessible for the tourism industry.

The Philippines is in the forefront in the use of renewable energies in Southeast Asia together with Indonesia and Thailand. The country generates more geothermal and hydroelectricity than solar and wind power. Electricity demand is expected to be nearly 3 times higher in 2020 than it was in 1995. Over the past decade, electricity growth has averaged in the range of 10% per year. This rate is expected to continue. The biggest boost for renewable energy is expected to come from hydropower. Already 14,000 megawatts in Southeast Asia is generated by hydropower (Table 27).

Solar photovoltaic

Solar photovoltaic can provide an autonomous source of energy for tourism facilities in remote coastal locations. The generation is smokeless and noise free and very low operating and maintenance costs are required once the system has been installed (no fuel or moving parts to repair). Long life spans of 20 to 25 years for the system can be

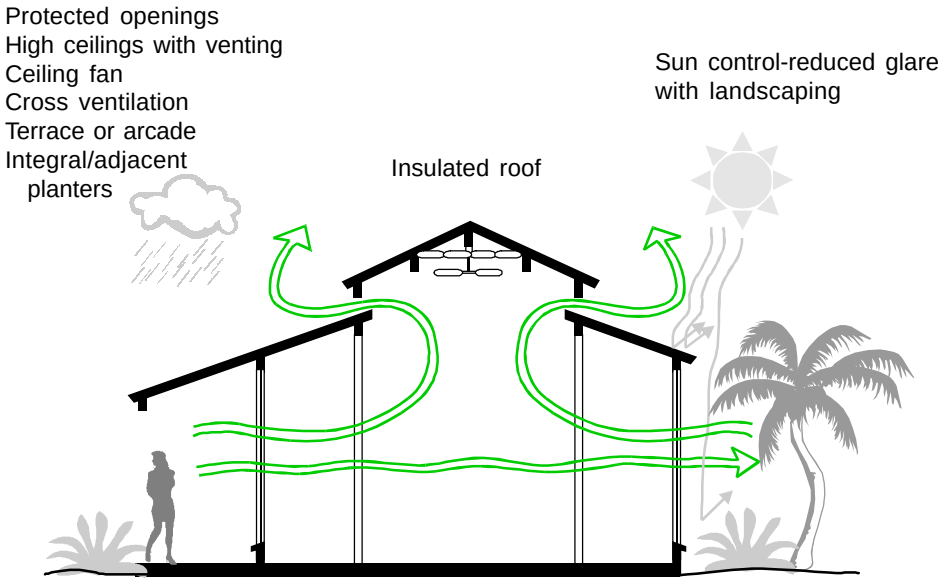


Figure 33: Building design options for natural ventilation (BBIR 1996)

Table 27. Installed renewable energy generating capacity (megawatts) in Southeast Asia in 1998

Countries	Geothermal	Hydro	Biomass	Solar photovoltaic	Wind	Total
Brunei	-	-	-	-	-	-
Indonesia	363	3,876	178	5	0.40	4,422.40
Cambodia	-	1	-	0.02	-	1.02
Laos PDR	-	210	-	-	-	210.00
Malaysia	-	1,471	2	0.80	0.15	1,473.95
Myanmar	-	340	-	0.24	-	340.24
Philippines	1,906	2,309	21	0.35	0.031	4,236.38
Singapore	-	-	-	-	-	-
Thailand	0.3	2,909	1,230	3.40	0.172	4,142.87
Vietnam	-	2,909	-	0.10	0.145	2,909.24
Total	**2,269.30**	**14,025**	**1,431**	**991**	**0.898**	**17,736.10**

Source: Hüttche (1999c)

expected which compensate for the high capital investment up front. For one tourist bungalow with a ceiling fan and two lights operating, the setup costs can range from US$2,500 to 3,000 (TEA 1999). This cost includes the photovoltaic modules, support structures, regulation unit, cables and fittings, energy-saving ceiling fan and light bulbs and special batteries to store the surplus energy for night usage and rainy days (Figure 34).

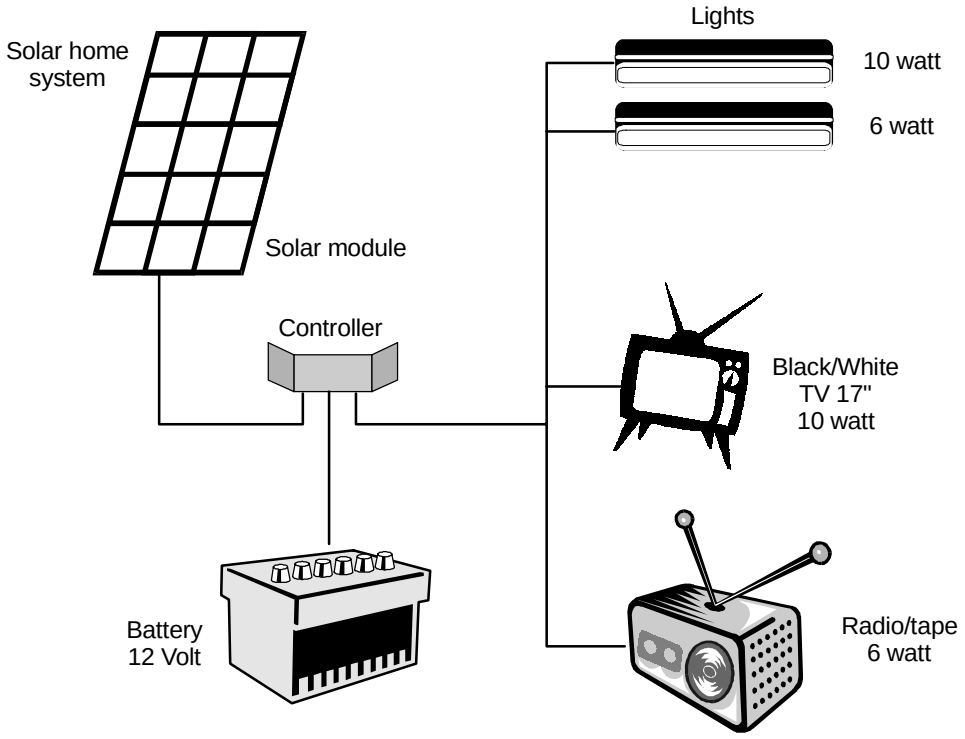


Figure 34: Components for a solar photovoltaic system with possible receivers (Hüttche 1999c)

Solar water heating systems

Solar water heaters are different from solar photovoltaic systems. They use the sun's energy to heat up water, but do not produce and store electrical power. They are suitable for all tourism facilities. Solar water heaters can provide 50 to 100 liters of warm water per unit. The technology is simple and reliable. It consists of a collector, a heat transfer circuit and a reservoir tank. Prices range from US$400 to US$2,000 for a 100-liter capacity solar water heater depending on quality, climatic conditions, materials used and local labor costs. Usually a solar water heater acts as a pre-heater and can be easily integrated with the normal hot water supply. A solar water heater has a life span of up to 20 years. It requires low skill levels to operate and maintain.

Wind power

The generating capacity for wind power systems ranges from 100 watts to 1 megawatt. The systems require the installation of a generator with rotor, tower, battery bank and control unit (Figure 35). A generator with an average capacity of 500 W with a 5-m diameter rotor and a life span of 10 years can cost US$20,000 (TEA 1999). These systems may benefit coastal resorts as these areas are generally exposed to wind. An average wind speed of greater than 4 m per second is necessary if wind energy is to be economically feasible. In this case, wind generators are often cheaper than solar PV and diesel generators. But, because wind speeds are variable, large batteries are required, which are expensive. Skilled technicians are required to install and maintain the system. Maintenance requires regular checking and access to new parts.

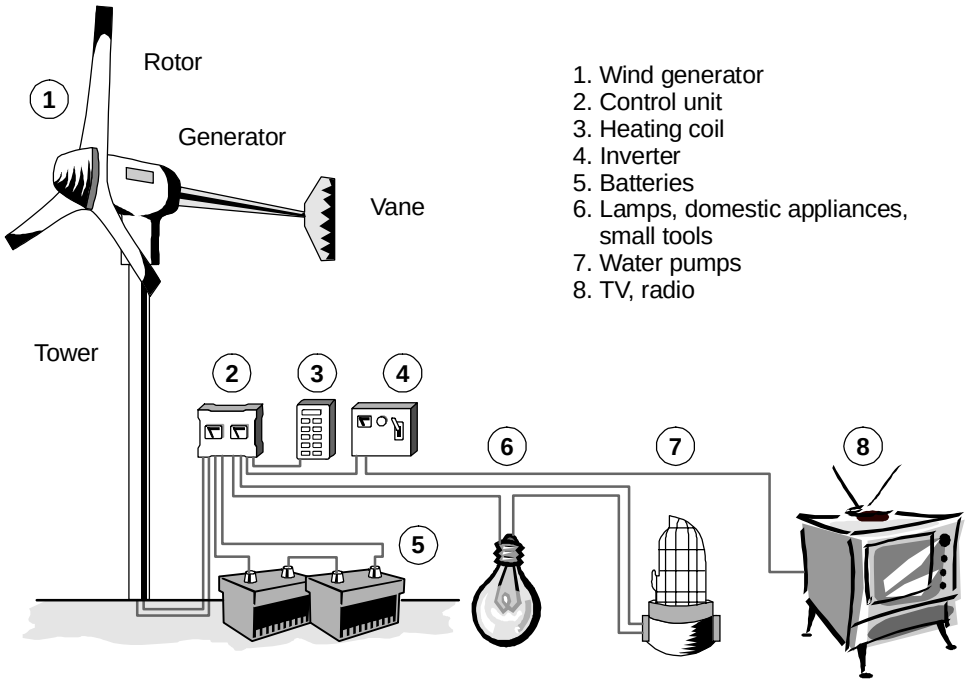


Figure 35: Typical wind generator system components (Hüttche 1999c)

Hydro power

Electricity can be generated on a small scale using the water flow in rivers and streams (Figure 36). Hydro plants are classified as: micro (less than 100 kW), mini (100-500 kW), small (500-1,000 kW) or large (above 1,000 kW). The first two systems are more relevant to tourism projects. These systems consist of a weir (small dam), settling tank, turbine and generator and control mechanism. Micro and mini hydro are most suitable where there is no grid extension. Investment costs for micro and mini hydro plants are very site-specific. They depend on the distance between the plant and the tourism facility and on what the electricity will be used for. To avoid large distribution costs, the hydro plant should be 5 km or less from the resort. A well-maintained system can last about 20 years without any major new investments.

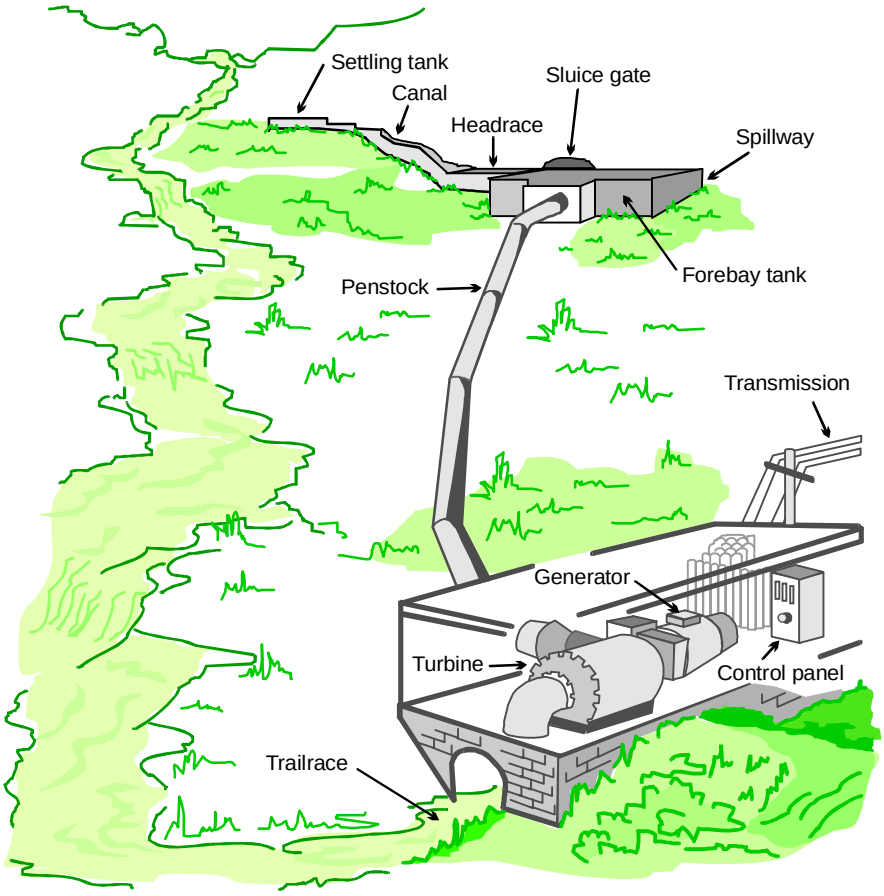


Figure 36: Example of a mini-hydro plant for electricity generation (Hüttche 1999c)

Marinas and Shoreline Protection Structures

Marinas of any scale require an EIA in the Philippines and should always be sited in areas with good water circulation, steep banks and natural wave and storm protection. To reduce potential damage to shorelines and the need for expensive and damaging dredging and bulkheads, boat slips should be placed out into the water and connected to shore with wharves. If important wetlands or other coastal features exist, developers should avoid building on or filling these areas.

Methods used to prevent beach erosion include "hard" engineering solutions that are permanent features designed to reflect or dissipate incoming waves and "soft" engineering solutions that do not involve hard structures. Examples of hard engineering solutions are seawalls, bulkheads, groins and jetties. Soft engineering solutions such as good planning and prevention are preferred because they retain the natural form of the shoreline and beach and because hard structures usually accelerate sand losses. Also, once hard structures are in place, they are costly to maintain and difficult to remove to correct a mistake or to adapt to new changes (Clark 1985).

Seawalls, bulkheads and sheet piling are solid vertical walls constructed of concrete, masonry, or metal which all serve the same purpose. These methods are used to combat erosion because they require less material and space. However, due to their verticalness, reflective wave energy is maximized, creating the potential for undermining and destruction of the beach or other land form being protected as indicated in Figure 37.

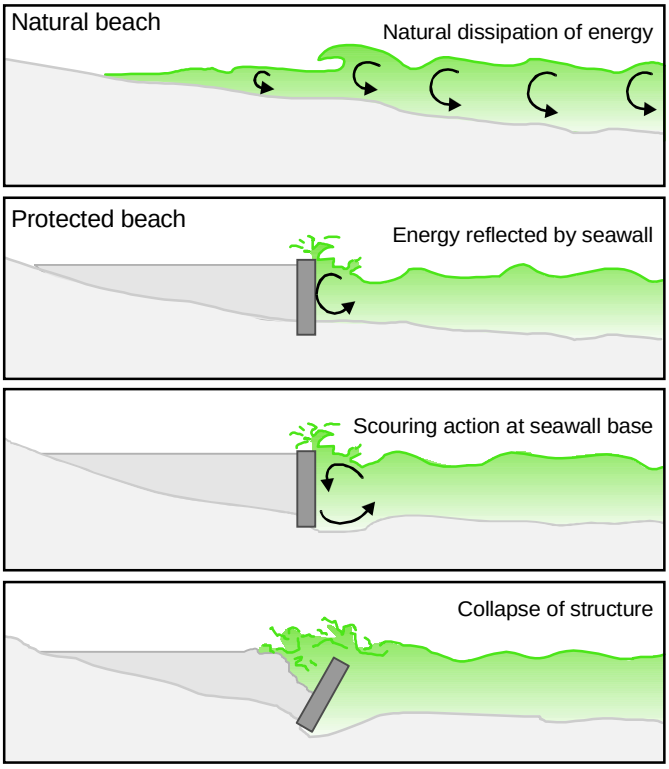


Figure 37: Undermining of a seawall built on a high energy coastline (CCD 1997)

Groins, breakwaters and jetties are structures predominately built with rocks or concrete. Groins or their variations are placed perpendicular to the shoreline to trap sand on the updrift side by extending out into the water and interrupting the littoral drift, causing deposition of sand. However, after the water column loses its suspended sand load, its velocity increases, causing it to wrap around the groin and pull more sand away from the down-drift side, resulting in beach loss and erosion. Such structures tend to cause more problems than they solve unless they are very carefully designed and placed appropriately in relation to the shoreline features, drift and wave patterns of the water (Figure 38).

Seawalls are vulnerable to erosion and collapse as portrayed in Figure 37.

Revetments are sloping rock walls and similar protective structures that are used along the coast to prevent undermining and erosion of coastal lands. The slope of the wall and the spaces between the rocks act to dissipate wave energy and minimize reflective waves. Revetments require a large amount of coastal area and building materials, making them a less economically viable alternative.

Beach nourishment is another form of erosion control in which sand is brought onto an eroding beach to replace lost sand. Nourishment must be done periodically if beach erosion continues. Nourishment is costly and since it is usually prohibited to mine sand, the source of sand may be limited or not available. An eroding beach needs to be analyzed for what is causing the erosion and the most appropriate solution sought considering nature, cost and legal restrictions.

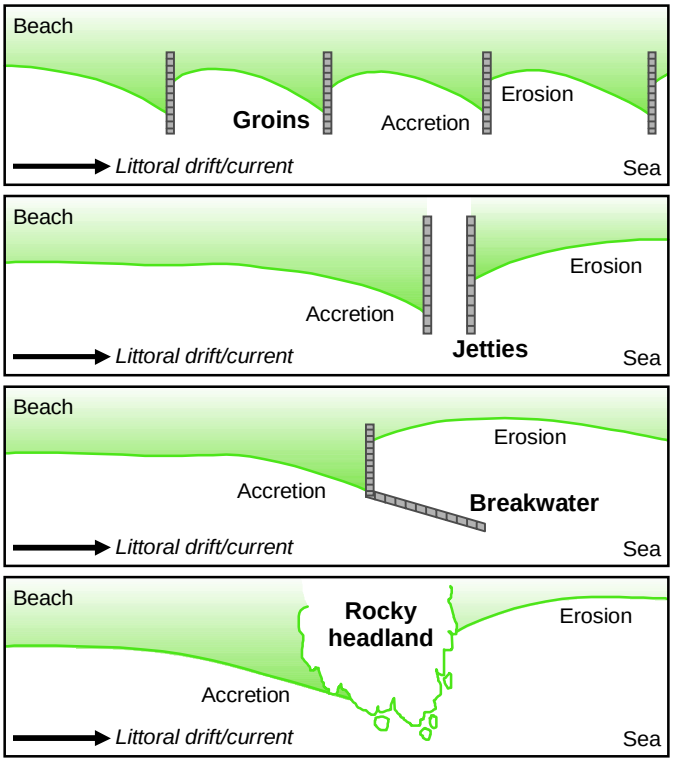


Figure 38: Effects of placing groins, jetties or breakwaters along a shoreline (Clark 1985)

In all options of protecting coastal areas from erosion, the science is highly imprecise and costly. Engineering studies to determine placement of the structure, obtaining permits, building materials and construction are some of the initial costs. Long-term maintenance can be very costly depending on the structure used or the erosion forces of the area. The only method of avoiding these costs is to not develop along eroding beaches. If development is to occur on these beaches, setbacks must be followed to prevent property damage and large costs.

In planning a coastal tourist establishment, the hazards of beach erosion may be avoided by following several "golden rules" for combating beach erosion:

- Understand the natural beach system before it is altered. Site-specific studies may be required at many locations to insure wise planning decisions;
- Develop a setback line before construction begins;
- Never mine the sand from the dune, beach or nearshore sandbars;
- Where a major obstruction to longshore water transport is built, such as a harbor, use soft solutions, such as sand nourishment or diversion of channels, rather than hard solutions, such as revetments or seawalls, to solve beach erosion problems; and
- Do not panic after a storm has drastically altered the beach. Wherever possible, let the normal beach cycle return the sand.

Case Study: Mactan Island

The southeast coast of Mactan Island is an example of uncontrolled development starting in the 1970s that has culminated in a highly modified shoreline. Although in hindsight it cannot be changed, there are lessons to be learned for Philippine shoreline development as noted in the following case study.

CASE STUDY: The Changed Rocky and Sandy Coast of Mactan Island

As a coastal resort destination, Mactan Island stands in sharp contrast to the coast destinations in other Southeast Asian countries. Mactan's coastal tourism has essentially developed on a low rock coast with two lagoons facing a deep sea fringed by viable coral reefs. The Mactan shoreline is characterized by short sandy beaches between pronounced coral rock outcrops serving as "headlands" along the southeast coast facing Olango Island (Figure 39). Since the 1970s, this coast has experienced significant change due to poorly planned resort development.

Three types of modification to Mactan's southeast coast can be identified. The early stage involved the least amount of change to the rock coast. The existing limited sandy beaches were used and sea walls were built where necessary. The middle stage of modification witnessed a variety of coastal structures built to retain the beaches, together

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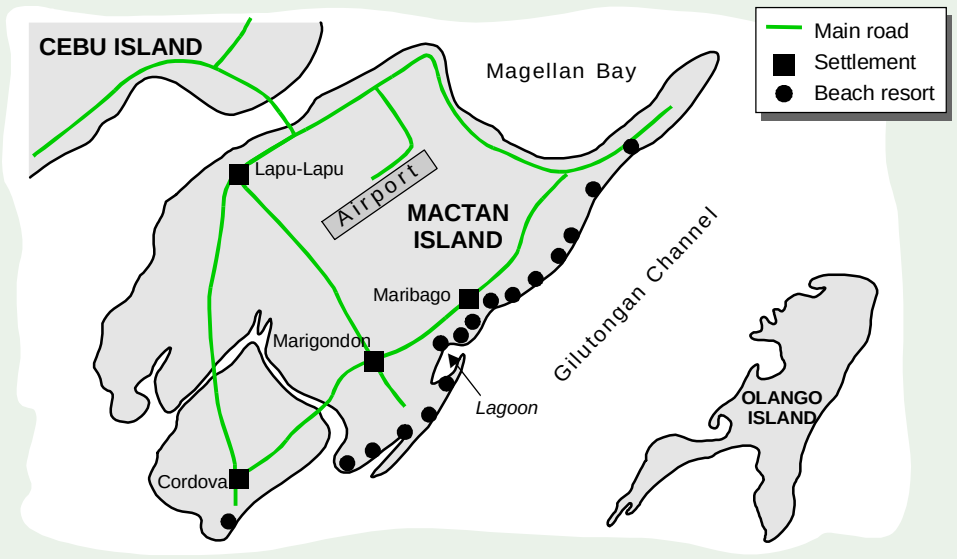

Figure 39: Beach resort location on the southeastern coast of Mactan Island (Wong 1999)

with the use of imported sand for beach nourishment. Groins and breakwaters were deployed in various ways to create different resort layouts. The final stage of modification was the excavation of the rock coast and the creation of new and artificial beaches (Figure 40).

Shangri-La's Mactan Island Resort was the first to carry out the bold move of excavating the rock and building an entire artificial beach. The process of creating a new beach started with the initial removal of the rock along a 350 m stretch by jackhammers to form a large bay. Two large outcrops were left behind to remain as islands and to help retain sand. Two large groins were constructed at the ends of the new bay. Natural sand, in the form of shoals, was placed at appropriate depths for waves to move into the bay. Eventually, three separate foreshore beaches with a continuous backshore beach were formed.

The construction of the Plantation Bay Resort involved the initial excavation of rock at the head of the natural lagoon. The artificial lagoon extension was then shaped appropriately and provided with a cement bottom. Plantation Bay created a 3.5 hectare lagoon of seawater surrounding a central pool of freshwater. The seawater is pumped from the sea, filtered and goes into the lagoon. Dolomite granules are used for the artificial beaches forming the sides of the lagoon and separating it from the central freshwater swimming pool.

These examples are not highlighted for good practices of shoreline resort development. Rather, they have totally modified the natural shoreline environment originally present on Mactan and have created an environment that is artificial and also difficult and expensive to maintain. In the case of Plantation Bay, the natural lagoon has been replaced with an artificial one that depends on pumped water and a high level of maintenance.

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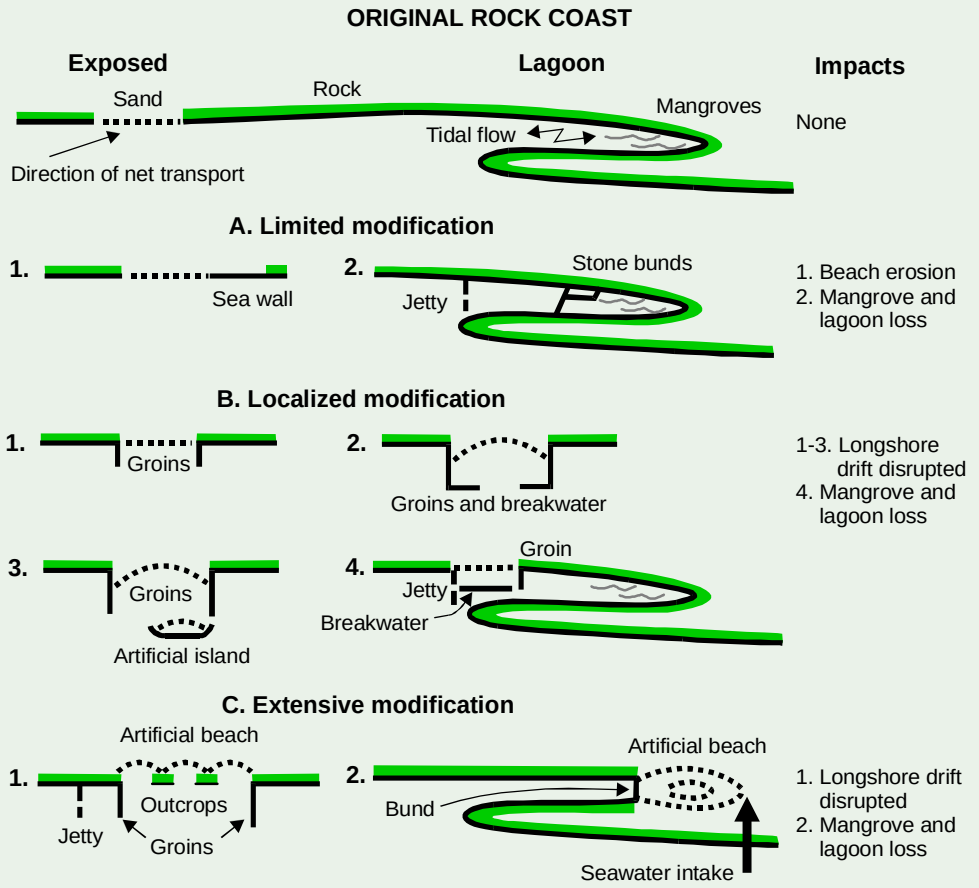


Figure 40: Modification of the rock coast for resorts along the Mactan Island shore (Wong 1999)

Although commercially understandable, the creation of artificial beaches and lagoons causes adverse impacts to the environment. The coasts are highly dynamic systems with affecting factors such as tidal currents, monsoon winds and waves or typhoons. Modifications such as excavations of rocky coasts are major changes to these shorelines. Sand supply for artificial beaches is a critical problem possibly triggering illegal sand mining activities from other islands in the Philippines and is thus not sustainable. Lessons learned from the experience on Mactan Island are:

- The construction of one improper structure on a beach or nearshore area causes a chain of events that affects other shoreline areas and beaches forcing neighboring resorts to follow suit and build more structures to try to save their beaches;
- The lack of setback requirements and lack of enforcement against illegal structures on the beach or in the water for all shoreline developments in Mactan has allowed structures to be built in an almost random manner;
- The lack of a shoreline development and environmental plan under the local government foreclosed the option of maintaining a natural shoreline environment;
- Once artificial beaches are created, the supply of sand becomes critical, is expensive and requires illegal sand mining in other areas; and
- In the long term, a natural shoreline without structures on the beach or in the water is more aesthetically appealing and certainly more economically efficient to maintain.

Landscaping Design

The coastal regions of the tropics contain delicate species of vegetation that provide protection from storms, habitat for birds and mammals, shade from the sun, and a barrier to erosion forces of the ocean. The best approach concerning vegetation removal and landscaping is to leave as much of the preexisting vegetation in place as possible. Removal of vegetation will increase erosion of valuable topsoil, cause sedimentation and pollution to local waters, and raise costs of the project. Further, large trees can take decades to grow and should therefore be considered an asset for the shade and beauty they provide to the landscape (Figure 41).

Landscaping can make a resort environment very accommodating.

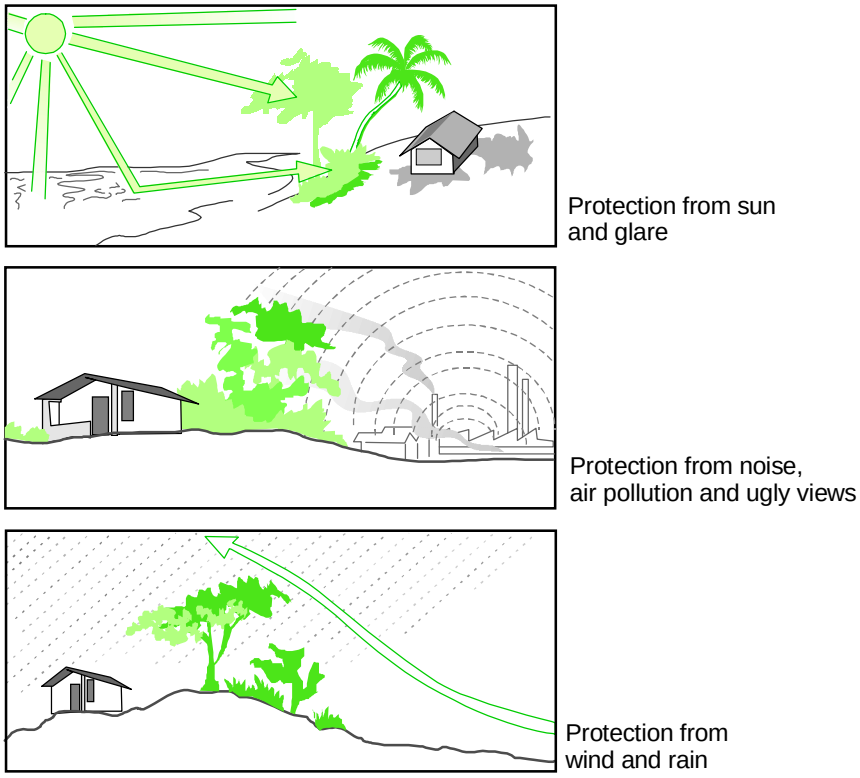


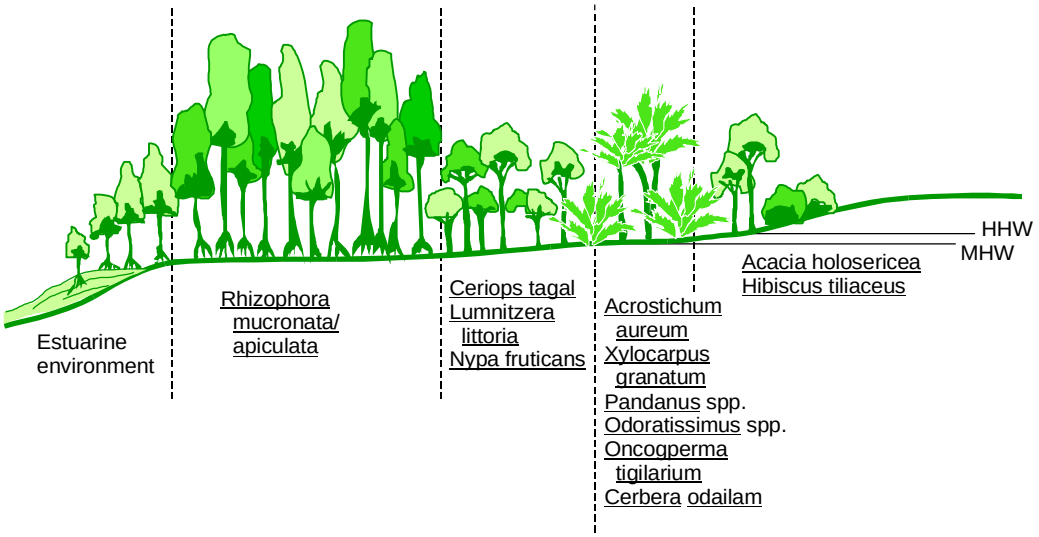
Figure 41: Services provided by trees and vegetation that enhance the environmental and aesthetic quality of a coastal tourism facility (Packard and Kliment 1989)

The landscaping requirements of any tourist facility will vary according to physical parameters such as soil type, exposure to elements such as winds and saltwater, amount of rainfall and contour of the development area. Requirements will also vary according to the social dimension of the facility. Some social parameters include the type of tourist desired, privacy and visual aesthetics. Practical considerations include the amount of maintenance that will be invested in the landscape, as well as cost. An overall plan should be developed with the consultation of someone who knows about vegetation and who is familiar with the physical constraints in a given area. Unplanned landscaping can lead to future problems such as obscured views or buckled pavements. Planned landscapes can enhance the atmosphere of a resort and provide guests shade and privacy. Physical factors affecting the choice of plants include:

- Rainfall seasonality and amounts;
- Direction, velocity and nature of prevailing winds;
- Composition of soils, their movement and stability;
- Presence of adjacent water bodies other than the ocean such as rivers, swamps or lagoons;
- Types of wildlife in the area; and
- Amount of saltwater intrusion into coastal soils during storm seasons.

The following suggestions can help to increase the value of the landscape as well as to protect the natural environment from negative impacts of vegetation removal:

- Protect natural vegetation from construction activities by fencing them off during construction or by transplanting them into on-site nurseries;
- Use indigenous species for replanting: they are already adapted to the harsh environments of salt-spray, wind, sun, sandy soil, and they are also less water consuming;
- Be realistic about the design of the landscape in relation to ability to maintain it;
- Root-balled trees are not good alternatives to leaving trees in place. They are expensive to transplant, are subject to sudden death, and take many years to establish themselves;
- Select trees and shrubs that root vertically and deeply rather than species that root horizontally or shallow to avoid damage to foundations, walkways or other structures;
- Use flowering and fruiting species that attract birds, mammals and insects if these are desirable to your guests;
- Use hardwood species so that there is less chance of damage to property or injury to guest from falling branches and limbs;
- Use species with graceful shapes that do not lose their leaves seasonally, but throughout the year;
- When using coconut, remember that these trees will grow very tall and may pose a hazard to an adjacent building or people from falling fronds and nuts; and
- Explore mangroves as resort landscape features or for activity areas (Figures 42 and 43).



Note: Certain mangrove species and their associates grow in specific zones (inner to outer) depending on factors such as seawater salinity and inundation level (HHW= high highwater; MHW mean highwater).

Figure 42: Mangroves are attractive landscape features due to their diverse adaptation to inundation with a mix of seawater and freshwater (Hüttche 1997)

Figure 43: Mangroves can be made accessible via elevated boardwalks connected to other resort facilities (BBIR 1996)

When watering plants, use of “grey water” from shower drains and kitchen sinks should be considered, especially in areas where water demand is greater than water supply from local sources. This way, water is recycled, thereby reducing economic costs associated with water use while at the same time conserving a limited natural resource. If grey water is used, the use of laundry and kitchen soaps that are biodegradable and have reduced phosphate should be preferred as these extra nutrients can be harmful to coastal waters and groundwater supplies.

Further, any watering of vegetation should be done after sunset to allow maximum absorption of water. Watering of vegetation in the morning or during the day should be avoided since a large amount of the water will evaporate and therefore be wasted. Also, watering during the daytime will scorch some plants.

Summary

The factor that determines the success of a coastal resort more than any other is appropriate site selection and use of the property. Planning site use is the golden opportunity for mitigating most potential environmental pitfalls that could come to haunt a development in later years. If any aspect of the development disturbs the natural environment excessively, it will detract from the aesthetics of the area and its viability as a tourism destination. Coastal areas are sensitive environments with valuable natural ecological functions that must be understood and planned for using proper expertise, solutions and adequate investment.

CHAPTER 8

Construction Activities

Construction is when humans take over. This is always dangerous and requires careful planning and management to prevent unwanted results.

During construction of coastal tourism facilities, various direct and indirect environmental impacts occur. Therein lies the nature of construction, an activity causing alterations in the physical, biological and social environment.

Some impacts are temporary and cease when construction is complete, others alter the coastal landscape irreversibly. Secondary impacts from construction such as soil erosion, increased surface runoff and siltation of coastal waters can be more serious as they can affect larger areas than the original construction site. By means of surface runoff into coastal areas, various ecosystem types can be impacted, for instance, coastal streams, wetlands or coral reefs.

Construction activities, if not planned and controlled, can cause irreplaceable environmental damage to a development site.

Environmental Impact Assessments (EIAs) in any form help guide construction activities to minimize negative impacts. Environmental Clearance Certificate (ECC) requirements should also be followed.

Careful management of construction activities in coastal environments benefits the environment and protects the investment into existing coastal assets such as clean beaches and seas. In many cases, where no proper environmental controls were exercised during construction, repairs and cleanup measures of scenic beaches or lagoons become expensive.

Building Materials and Standards for Construction

In most cases, developers use local materials for the construction of facilities. In coastal areas, the use of sand to make concrete for permanent structures can have serious impacts. Beaches are lost as a result of sand removal. Sand mining can cause sedimentation in nearshore waters. Using coral as a construction material causes direct loss of large areas of reef. Historically, coral rocks were used in the construction of some houses, tourist facilities and shoreline protection measures. This coral mining led to significant loss of reefs and extensive coastal erosion and loss of valuable beaches. Coral is now strictly protected and not used.

Besides conventional materials, such as sand, gravel and wood, resorts can use materials recycled from other sources. Many new recycled materials are attractive, durable and relatively inexpensive. These materials include sawdust and plastic. Materials from resorts' operations like bottles can be recycled into products such as glasses and tiles. Certain native materials can also be used creatively in resort design and construction such as coconut and its derived fiber products, *nipa* palm and other local materials.

The following set of standards can be copied and amended by LGUs and developers to suit their individual needs. They should be made known to all involved construction contractors by making them part of contractual agreements. If contractors fail to comply with these standards, they have to cover mitigation or repair expenses and can be punished with contractual fines.

Pre-construction preparations

- Preserve a sufficient area around remaining trees with smaller trees and undergrowth to protect trees from sun and heat stress as well as immediate damage through construction.
- Prior to, and during construction, all trees/habitats should be clearly defined, so that inadvertent entry does not occur. Areas may be delineated either by:
  - Placement of temporary construction fencing to restrict access into sensitive areas
  - Posting of signs on durable posts, or on construction fence, to indicate that these areas should be avoided.
- In addition, orientation training should be conducted for all construction workers to advise them of the restrictions on entering environmentally sensitive areas.
- Protect 'stepping stone' habitats from damage during construction. 'Stepping stones' are habitat pockets to which wildlife can retreat during construction or which are used by wildlife to migrate temporarily to undisturbed areas.
- Avoid disturbances from construction during breeding seasons of sensitive bird species, sea turtles or other wildlife. Seal off effective nest and roost sites.

During construction: Clearing and removal practices

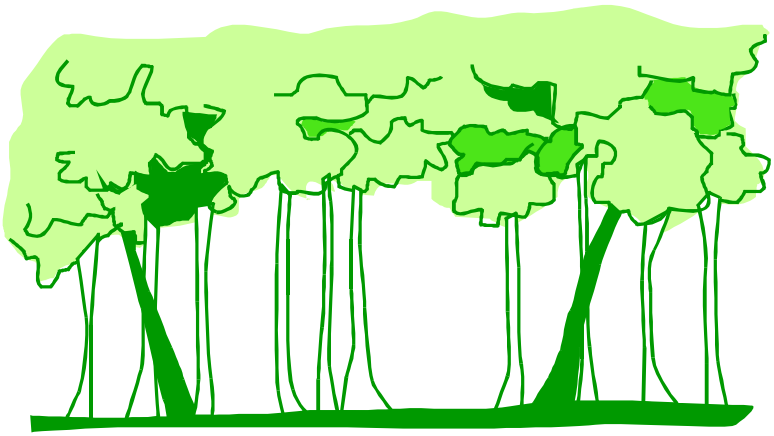
Practice the proposed standards for clearing, grading excavation and earthwork, temporary drainage and construction as outlined below. The practice of clearing or removing vegetation from the project site should be based on the following principles:

- To allow for construction of specific structures and facilities;
- To ensure public health, safety and welfare;
- To enhance the aesthetic impact of proposed developments within the context of the development;
- To minimize the degree and extent of clearing as much as possible;
- To reduce costs of clearing and re-landscaping;
- To reduce the potential for soil erosion; and
- To limit impacts on the coastal and stream waters and on the local ecology.

Any clearing and removal activity can be described as belonging to one of the four following categories in order of preference in maintaining the environment (Figure 44):

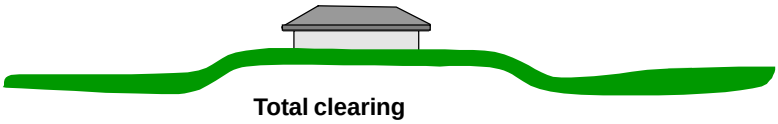
- **No clearing:** No removal of plant understory or tree felling; an area of retained forest with no access provided.
- **Aesthetic clearing:** Removal of understory vegetation for visual access and aesthetic enhancement, to the extent indicated on the landscape design drawings.
  - To minimize disturbance to existing soils, aesthetic clearing work should be carried out manually, and no heavy equipment should be used.
  - Aesthetic clearing is distinct from selective clearing and should be carried out separately.
- **Selective clearing:** Removal of dangerous trees and potentially dangerous trees to ensure public health, safety and welfare.
  - To minimize disturbance to the existing soil and other plants, selective clearing should be carried out manually, no heavy machinery should be used.
  - Selective clearing is distinct from total clearing and should be carried out separately.
  - Cut dangerous and potentially dangerous trees, which have been identified and marked (based on such factors as size, species, condition, proximity to development). Tree felling should not be carried out by heavy equipment. Trees should be felled towards the total clearance area. Trees should be cut as near to the existing ground level as possible. Stump and roots should not be removed or disturbed.
  - Rough grading should use native topsoil to fill local depressions to prevent pockets of standing water and provide overall positive drainage.
- **Total clearing:** Removal of all vegetation in the area required for construction.
  - Only where completely necessary for building construction or safety reasons.
  - Tree felling should begin at the center of the clearance area and move towards the limit of work to prevent damage outside the limit of clearing work.
  - Tree stumps should only be removed where buildings or underground services are to be located but left in other areas and cut as close to grade as possible.

- All waste vegetation should be collected and disposed of, or chipped in a chipping machine. Burn clearing should not be done because of adverse environmental impacts.



Aesthetic clearing

Selective clearing



Total clearing

Note: Total clearing in coastal areas should be avoided. Coastal buffer zones should be fenced off and remain undisturbed

Figure 44: Methods of clearing (BBIR 1996)

Specific guidelines for clearing and removal

Key points to consider are:

- Contractors should have and follow approved clearing plans;
- Clearing plans should indicate which trees are to be cleared, which are to be relocated, and which are to be preserved in place;
- To reduce the potential for soil erosion and sedimentation of waterways, clearing and grading activities should be phased to limit the area of land left unvegetated at one time;
- No clearing should be done within the established setbacks from streams or coastal waters;
- A vegetated buffer strip of approximately 30 m should be maintained between cleared areas and coastal or stream waters to help filter runoff water and prevent sedimentation;
- Clearing should not alter existing stream flows or natural drainage;
- No clearing of mangrove areas should take place;
- No mature trees should be cleared for the purposes of locating temporary structures; and
- Revegetation of cleared areas should be conducted as soon as practical to prevent soil erosion. Areas that must remain cleared for more than 30 days before construction or landscaping should be temporarily vegetated with an appropriate grass or groundcover.

During construction: Grading, excavation and earthwork

Grading, excavation and earthwork should be minimized as much as possible and limited to only those areas absolutely needed for one or more of the following structures:

- Roadways;
- Drainage and sewerage works;
- Electrical and communication lines;
- Topsoil stripping or leveling to insure that minimum depths of fill are maintained; and
- Building foundations.

Extent of clearing was not considered in this construction site since no vegetation remains!

To preserve topsoil, and limit off-site disposal, amounts of cut and fill should be balanced as much as possible. Also, the use of heavy machinery for grading and earthwork should be limited as much as practical to prevent impacts to the existing soil profile and vegetation.

A vegetated buffer strip of approximately 30 m should be maintained between areas of earthwork and coastal or stream waters to help filter runoff water and prevent sedimentation of waterways. Excavation or earthwork should not alter existing stream flows or drainageways. All grading and earthwork activities

should incorporate appropriate measures to control fugitive dust and noise, and prevent nuisance to neighboring properties. Such measures may include:

- Construction site fencing;
- Periodic dampening of exposed soil; and
- Use of proper exhaust systems and mufflers in buildings and equipment.

Excavated material that is not as valuable as topsoil should be used in areas requiring fill material other than gravel or topsoil.

During construction: Temporary drainage

Temporary measures to handle drainage in and around construction sites should be incorporated to prevent flooding and washout of facilities, and to reduce soil erosion. They may include, but not be limited to (Figures 45 and 46):

- Diversion structures such as dikes, or temporary drains to route surface drainage away from cleared or excavated areas or buildings;
- Detention basins or sedimentation ponds to capture runoff from cleared or excavated areas so that it is not discharged directly into coastal or inland waterways; and
- Silt traps, filters and other structures installed at appropriate locations on-site to filter surface waters before they are discharged to coastal or inland waterways.

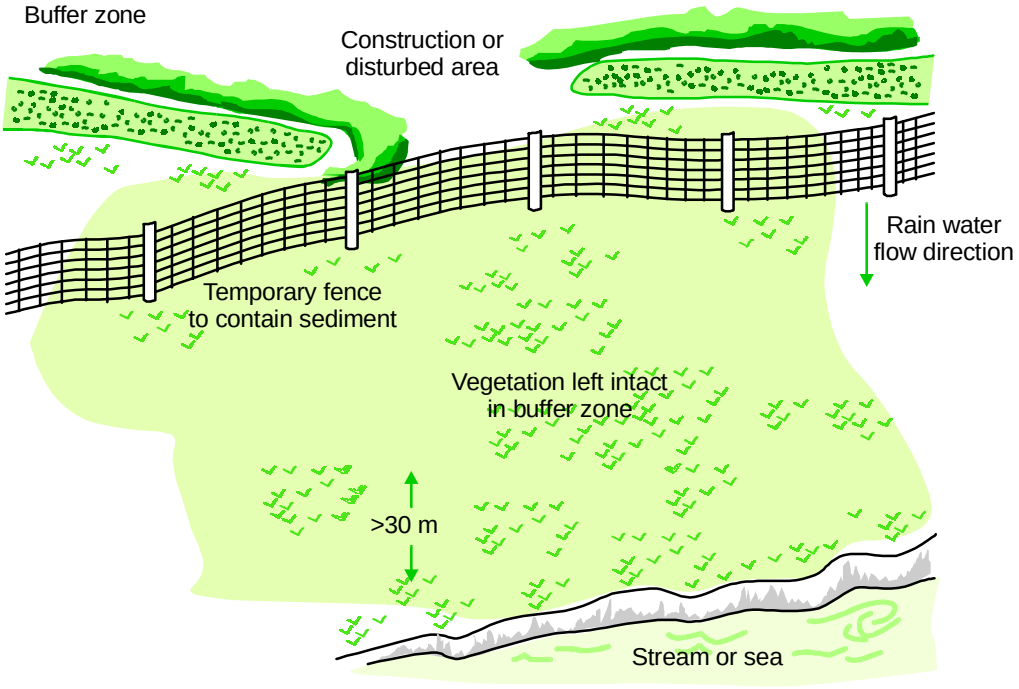


Figure 45: Fencing and vegetative buffers protect streams and seas from the effects of soil runoff from construction sites (EPS 1999)

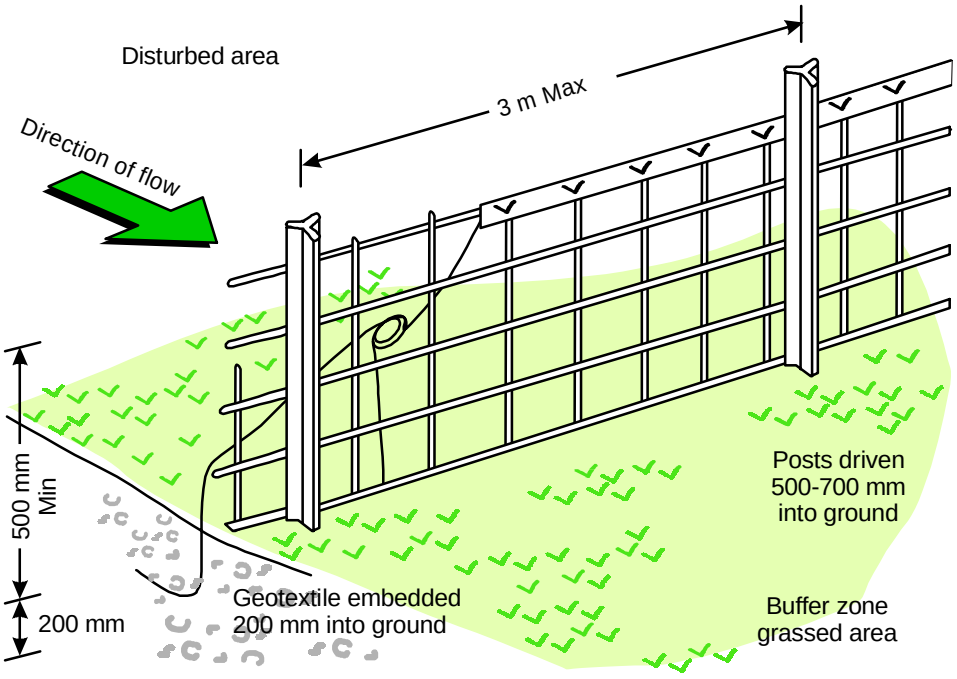


Figure 46: Geotextile fencing details (EPS 1999)

Surface runoff

During construction of coastal tourism facilities, large areas are stripped of the protecting vegetation cover to allow for grading and earthwork. During this work stage, surface runoff is often polluted with silt, temporarily affecting water quality and coastal ecosystems such as coral reefs. An erosion and surface runoff control plan should be prepared showing how erosion will be minimized and surface runoff slowed.

The potential measures for erosion control may include sediment basins, embankments, sediment traps, interceptor ditches, interceptor dikes, containment dikes, filter berms and inlets, chutes, flumes, down-drains, mulching, hydroseeding, temporary vegetative cover and dust control. If a project site is in close proximity to the shoreline, specific erosion control measures are recommended. A perimeter geotextile silt fence, placed between the building sites and the shoreline should prevent runoff of sediments into the surrounding coastal waters (Figure 43).

Swales or interceptor ditches can be dug in areas above the silt fence to enlarge the water holding capacity and channel the water to specific locations for further retention or treatment (Figure 47).

Other practices to minimize adverse impacts during construction

Other construction related issues and solutions include:

- Construction vehicles should follow designated delivery routes and hours of delivery;

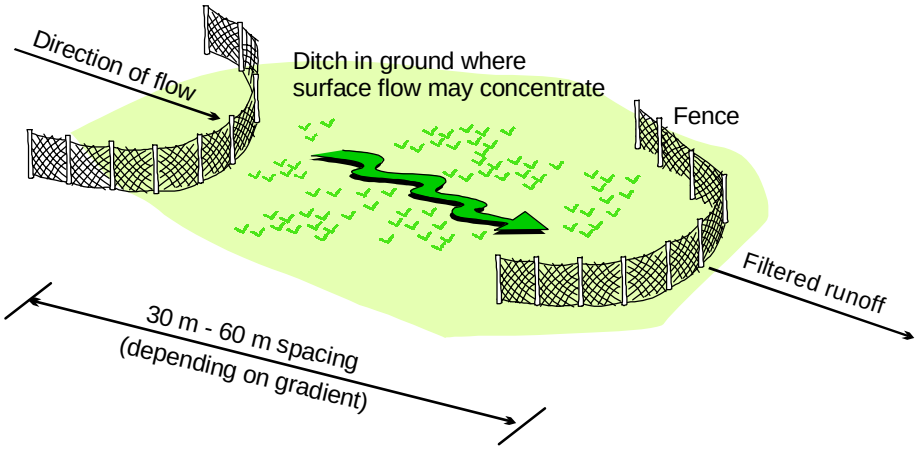


Figure 47: Sequence of geotextile silt fences placed in the direction of flow to filter runoff. Sequencing allows better filtration and provides better protection in case one fence collapses (EPS 1999)

- Construction should be screened off from adjoining properties with attractive fencing, planting, etc, to create a visual separation of the two areas to avoid creating a nuisance;
- Lights used for nighttime construction should minimize lighting of adjacent properties;
- Petroleum products used on construction equipment should be stored and handled in a manner to minimize potential for spills;
- Trash and debris generated on-site should be contained in closed receptacles that are screened from the views of adjoining parcels; and
- No burning of trash or debris should take place on-site.

SUMMARY

In short, construction is a necessary evil that often causes more damage than intended. It is a disruptive activity, especially in sensitive coastal environments, that requires having proactive preventive measures in place to minimize negative impacts. At the very least, a site construction management plan should be approved and followed that considers the problems discussed in this chapter. The most obvious culprit in causing damage to the marine environment is from soil erosion and unnecessary removal of natural vegetation. These should be minimized.

CHAPTER 9

Sewage, Wastewater and Stormwater Management

The most treasured resource of a tropical coast is the clean, inviting water for swimming, diving and relaxing—once polluted, it is lost!

Lack of public infrastructure such as centralized sewage treatment plants places the responsibility with individual developers. Considerations will include size of proposed project, topography of the site, height of water table at the site location and locations of freshwater wells. The desired environmental quality standards for wastewater effluent from coastal resorts are another important criteria for choosing the right system.

The proper disposal of sewage and wastewater is crucial for the coastal resorts to stay attractive for tourists. Unsafe bathing waters due to bacteria contamination, unsightly algae blooms caused by nutrient overloads, smothered and dying coral reefs are amongst the consequences resort operators will have to face if they fail to comply. Appropriate sewage and wastewater treatment systems are available which can be implemented by LGUs and small and medium-scale resort operations in coastal areas.

Clean coastal waters are a primary resource and an attraction for all potential visitors.

Coastal resort developers and operators should aim to comply with the national and international standards for wastewater and sewage discharge. It should be also taken into account that integrated coastal resort developments with golf courses are using a wide range of fertilizers and pesticides.

Two definitions of importance to this section are:

Effluent: A general term denoting any wastewater, partially or completely treated, or in its natural state, flowing out of a hotel, resort or treatment plant.

Biological oxygen demand (BOD): A measure of the approximate quantity of dissolved oxygen (DO), required by microorganisms to process organic matter in wastewater or surface water. A low BOD indicates clean water, a high BOD indicates organically polluted water.

PHILIPPINE STANDARDS

The Philippines has classified its marine waters according to use (Table 28). The quality standards for these tourism related classes of water are listed in Table 29.

By setting water quality standards for coastal waters, we know how clean the sea should be for swimming or bathing in the ocean. However, if there is a pollution problem, it is difficult to pinpoint the source in areas with dense coastal tourism development. The pollutants are diluted in the water and distributed by currents and waves. That makes it difficult to isolate one source, unless there is obvious evidence. For this reason, discharge standards are important to define. They measure the water quality at the outlet of each individual sewage treatment plant or other facilities (Table 30). As the effluent is not yet diluted, the values of standards are expected to be higher.

Table 28. Tourism relevant coastal and seawater quality classes

Class	Use
SA	Water suitable for the propagation, survival and harvesting of shellfish for commercial purposes; National marine parks established under the National Integrated Protected Areas System (NIPAS) Act (1992) and other existing laws and/or declared as such by appropriate government agency; and Coral reef parks and reserves designated by law and concerned authorities.
SB	Tourist zones and marine reserves primarily used for recreational activities such as bathing, swimming, skin diving, etc. under existing laws and/or declared as such by appropriate government agency; Recreational Water Class I (areas regularly used by the public for bathing, swimming, skin diving, etc.); and Fishery Water Class I (spawning areas for milkfish and similar species).
SC	Recreational Water Class II (e.g. boating, etc.); Fishery Water Class II (commercial and subsistence fishing); and Marshy and/or mangrove areas declared as fish or wildlife sanctuaries.
SD	Industrial Water Supply Class II (e.g. cooling, etc.); and Other coastal and marine water, by the quality, belong in this classification.

Table 29. Water quality criteria for conventional pollutants and toxic substances for coastal and marine waters.

Water quality parameter	Class SA waters	Class SB waters	Class SC waters	Class SD waters
Color	No abnormal discoloration from unnatural causes			
Temperature (°C rise)	3	3	3	3
pH (range)	6.5-8.5	6.0-8.5	6.0-8.5	6.0-9.0
Dissolved oxygen (minimum % saturation)	70	70	70	50
5 day 20°C Biological oxygen demand (mg/L)	3	3	7(10)	—
Total suspended solids (mg/L)	Not more than 30% increase	Not more than 30 mg/L increase	Not more than 30 mg/L increase	Not more than 60 mg/L increase
Surfactant (mg/L)	0.2	0.3	0.5	-
Oil and grease (mg/L)	1	2	3	5
Phenolic substances as phenols (mg/L)	Nil	0.01	Not present in concentration to affect fish flavor and taste	-
Total coliform (Most Probable Number/100 mL)	70	1,000	1,000	-
Fecal coliform (Most Probable Number/100 mL)	Nil	200	-	-
Copper (mg/L) as dissolved copper	-	0.2	0.05	-
Arsenic (mg/L)	0.05	0.05	0.05	-
Cadmium (mg/L)	0.01	0.01	0.01	-
Chromium-hexavalent (mg/L)	0.05	0.1	0.1	-
Cyanide (mg/L)	0.05	0.05	0.05	-
Lead (mg/L)	0.05	0.05	0.05	-
Total mercury (mg/L)	0.002	0.002	0.002	-
Organophosphate (mg/L)	Nil	Nil	Nil	-
Aldrin (mg/L)	0.001	-	-	-
Dichloro-diphenyl-trichloroethane (mg/L)	0.05	-	-	-
Dieldrin (mg/L)	0.001	-	-	-
Heptachlor (mg/L)	Nil	-	-	-
Lindane (mg/L)	0.004	-	-	-
Toxaphane (mg/L)	0.005	-	-	-
Methoxyclor (mg/L)	0.1	-	-	-
Chlordane (mg/L)	0.003	-	-	-
Endrin (mg/L)	Nil	-	-	-
Polychlorinated biphenyl (mg/L)	0.001	-	-	-

Notes: "Nil"- Extremely low concentration and not detectable by existing equipment
"-" - Means the standard not considered necessary at the present time, considering the stage of the country's development and DENR's capabilities, equipment, and resources.

Source: Tables No. 3 and 4 DENR AO No. 34 and Section 2 of DENR AO 97-23

Table 30. Effluent standards for conventional pollutants and toxic substances for protected coastal and marine waters.

Water quality parameter	Class SB	Class SC	Class SD
Color	100	No limits so long as the discharge does not cause abnormal discoloration in the receiving waters outside the mixing zone	
Temperature (°C rise)	3	3	3
pH (range)	6-9	6-9	5-9
Chemical oxygen demand (mg/L)	60	200	200
Settleable solids – 1 hr (mg/L)	0.3	-	-
5 day 20°C Biological oxygen demand (mg/L)	30	100	120
Total suspended solids (mg/L)	50	-	-
Total dissolved solids (mg/L)	1,000	-	-
Surfactant – MBAS (mg/L)	2	10	-
Oil and grease (mg/L)	5	10	15
Phenolic substances as phenols (mg/L)	0.05	0.5	1.0
Total coliform (Most Probable Number/100 mL)	3,000	-	-
Arsenic (mg/L)	0.1	0.5	0.5
Cadmium (mg/L)	0.02	0.1	0.2
Chromium-hexavalent (mg/L)	0.05	0.2	0.5
Cyanide (mg/L)	0.1	0.2	-
Lead (mg/L)	0.1	0.5	-
Mercury (total) (mg/L)	0.005	0.005	0.01
Polychlorinated biphenyl (mg/L)	0.003	0.003	-
Formaldehyde (mg/L)	1.0	1.0	-

Notes: "-" Means the standard not considered necessary at the present time, considering the stage of the country's development and DENR's capabilities, equipment, and resources.

Source: Tables 2A and 2B of DENR AO No. 35; Table 1 of DENR AO No. 35

By law, the coastal waters classified as tourist zones (SA) or marine parks should not receive any sewage or other effluent from any source including hotels or resorts. That means a developer who builds an ecotourism resort in a marine park or reserve, would have to treat and reuse the treated effluent 100% on land. He could water the lawn or the gardens with it.

However, in the second zone (SB), defined as the swimming and bathing zone, wastewater discharge of a certain quality is allowed. The stipulated standards are only achievable with proper wastewater treatment. When treatment is not adequate, the negative effects can be far reaching as described in the case study that follows.

CASE STUDY:
BORACAY ISLAND AND MARIBAGO, MACTAN ISLAND

In 1997, DENR tested the quality of marine waters off Boracay Island to find that the Philippine water quality standards for tourism areas were not being met. This led to the widely publicized reports of Boracay's waters being unsafe for swimming and other recreational activities due to high levels of coliform bacteria (total coliforms > 1,000 MPN/100 ml, fecal coliforms > 200 MPN/100 ml). There was a resultant drop in tourist arrivals to Boracay.

Also, in 1997, the impacts of coastal tourism in Maribago, Mactan Island, were assessed as part of a master's thesis by Martinez (1997). Marine water quality was selected to determine environmental impacts from coastal tourism. Maribago's coastal waters were classified as Class SB, the classification adopted in making the Mactan Island Integrated Master Plan Study (Schema Konsult 1996). Water quality analysis was conducted for several test stations before and after the peak tourist seasons. The results showed that even after the tourist peak season DO and BOD level were within the allowable levels, indicating good conditions for marine life. The average bacteria level measured in total coliform, however, were above the allowable 1,000 MPN/100 ml. This means that the waters were generally clean except that the sewage treatment systems were not functioning to full satisfaction during the peak tourist season, when approximately 800 visitors visited Maribago's 10 coastal resorts.

Lessons from these cases regarding prevention of pollution in tourism development areas include:

- Hotel operators and LGUs need to be proactive and use the quality standards to monitor and control the performance of their treatment systems;
- Regular water testing at the outlet of the system should be recorded and kept for reference or corrective actions;
- LGUs or NGOs with access to laboratory facilities or water testing kits can conduct independent control of water quality along beaches to detect potential sources of environmental pollution in the interest of the general public;
- DENR or the LGU should do more regular monitoring of water parameters, especially during seasons of high tourist visitation in prime tourism areas; and
- Hotel operators should seek cooperation with experts and the LGU to improve treatment capacities and qualities for wastewater and sewage.

SOUTHEAST ASIAN STANDARDS FOR WASTEWATER DISCHARGE FROM RESORTS

Water quality standards for wastewater discharge developed and adopted by some major regional coastal resorts can be used as benchmarks. These are noted in Table 31 with notes on handling and recycling of treated wastewater for irrigation or discharge into the sea. It is desirable to reuse treated wastewater to save on precious potable water resources.

Table 31. Regional quality standards for wastewater/sewage discharge into coastal waters (measured at the treatment plant outlet)

Water quality parameter	Unit	Standard	Notes
Water quality	visibility	clear	Odorless and not toxic upon ingestion
pH		6.5 to 8.5	Lime or acid may be added to correct pH
Temperature	^{0}C	40	35^{0}C detrimental to corals
Biological oxygen demand	mg/L	15	
Chemical oxygen demand	mg/L	50	
Total suspended solids	mg/L	20	Solids not in excess to inhibit rate of absorption into soil
Total dissolved solids	mg/L	2,000	
Chloride	mg/L	400	
Sulfate	mg/L	200	
Sulfide	mg/L	0.1	
Detergents	mg/L	1	No visual pollution, bubbles, foam, etc.
Grease and oil	mg/L	ND	Should not be detectable
Chlorine	mg/L	1	Toxic to plants and aquatic life
Phosphate	mg/L	4	Phosphate adversely affects plants and coral reefs, use phosphate-free detergents
Calcium	mg/L	200	
Magnesium	mg/L	200	
Nitrate	mg/L	13 - 26	90% removed through uptake by turf
Fecal coliform	MPN/100 ml	<300	Can disinfect with UV light or chlorination

Source: BBIR 1996

Sustainable Solutions for Sewage and Wastewater Disposal

Wastewater or "grey water" is the water stream resulting from water wastes from restaurants and hotels excluding sewage. This includes shower water from bathrooms and effluent from hotel laundries. Wastewater can be separated from stormwater and sewage for both treatment and disposal. During pipe laying, grey water should be led to a separate storage tank. This will help in reducing overall water volume to the septic system, preventing overload.

If the development is in an area of water shortage or if the developer wishes to conserve water, treated wastewater can be reused to water lawns, shrubs and golf courses or can be diverted for agricultural use. Reuse of wastewater is inexpensive and saves supply costs for potable water.

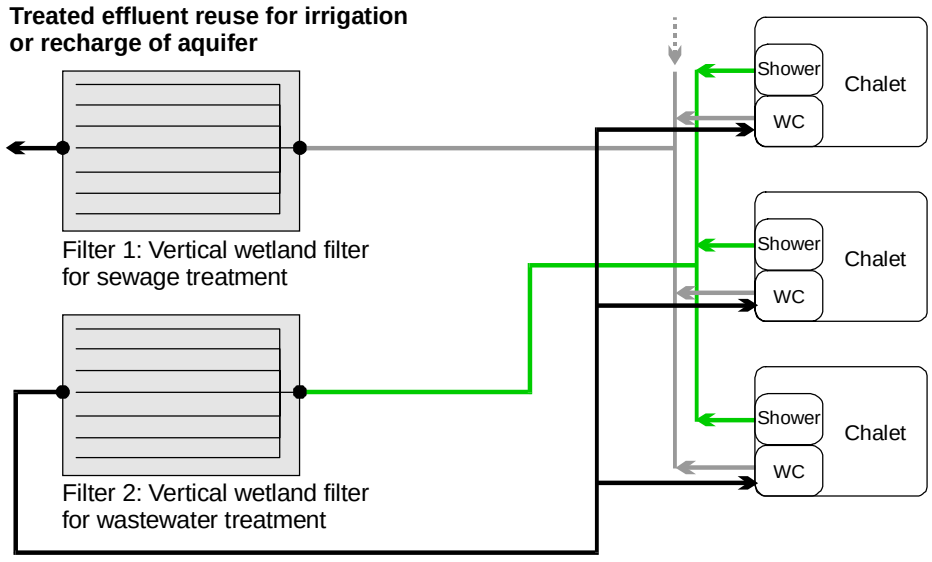
Treated grey water can be also reused for toilet flushing. There is no reason why valuable potable water needs to be flushed down the toilets. A combined treatment-recycle system based on the engineered wetland technology can be built for a 20-40 bungalow resort with an average water consumption of US$30,000 to 50,000. A simple system that separates and stores grey water is shown in Figure 48.

Grease traps

Grease traps are important in coastal resorts and hotels to minimize release of oily products to the sea or garden in the case of grey water recycling. Grease traps function as oil/water separators. The chambers of the grease traps slow down the flow and allow the grease and oils to build up on the water surface. The water is then discharged on the bottom of the chamber, retaining the grease cake in the traps.

Sewage and sewage management

Sewage comprises the waterborne wastes of a human community carried in a sewer system containing human, animal or vegetable waste in suspension or solution. Since there are few central municipal sewage treatment systems operating in the Philippines, other options are available for coastal tourism projects.



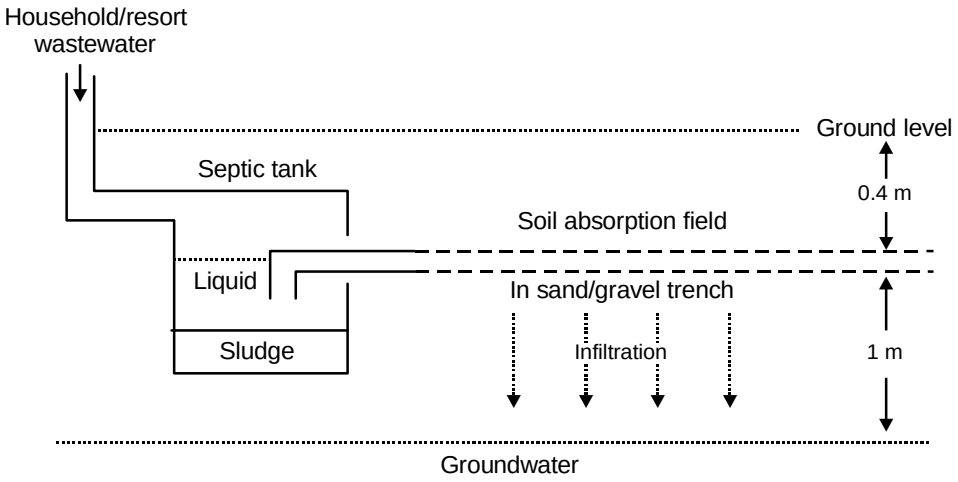
Note: The grey water from the resorts' showers is piped to Filter 2 for treatment (green line). After the treatment the effluent is stored temporarily in a holding tank before being sent back in a separate pipe system to the toilets for flushing (black line). The treated wastewater-turned-sewage is then piped to Filter I for treatment (grey line).

Figure 48: Schematic layout for a wastewater treatment and recycling system with engineered wetlands (Hüttche 1999b)

Septic systems

The least expensive solution, septic tanks are mainly used by medium to small-scale hotels, resorts and residential developments. Septic systems have two primary components: the septic tank, which breaks down the sewage through anaerobic action and the soakage pit which operates aerobically (Figure 49). A septic tank is a watertight settling tank to which wastes are carried. The first compartment of the two-compartment tank receives only pour and flush water, which passes after settlement into the second compartment. Liquification or settlement in the first compartment removes the solids. Septic tanks reduce BOD by 30-50% but fecal bacteria content is only reduced slightly.

The effluent is then discharged into the unsaturated soil of the soakage pit to remove more of the solid matter and toxins. Where the design or location of the soakage pit is inappropriate, the discharge from septic tanks into the environment may cause negative environmental impacts and potential human health risks.



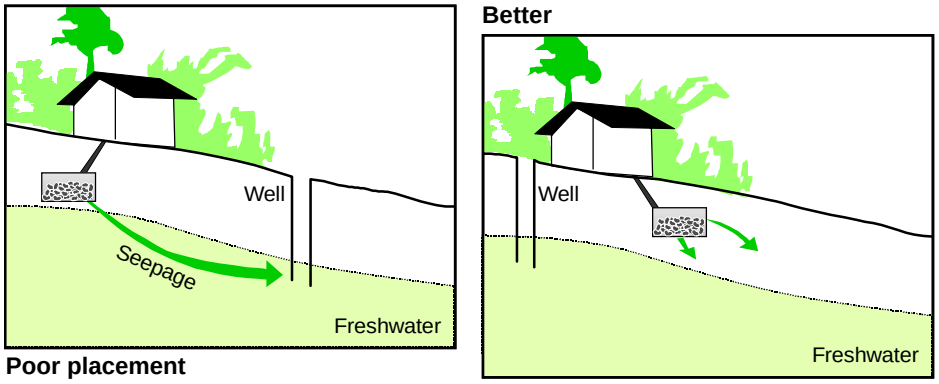
Note: Septic tank made of concrete or fiberglass adjacent to a soakage pit or soil absorption field.

Figure 49: Standard septic system design (Branan *et al.* 1991)

Placement of septic tanks

Contamination of potable water or seawater may occur if septic tanks are improperly placed (Figure 50). Therefore, the placement of a septic tank must be done in relation to any existing freshwater well. The distance between wells and septic tanks in residential areas could be 75-100 feet. A greater distance will be necessary for larger tourist facilities. Also, the septic tank must be placed in such a way that discharge from the septic system flows away from the well.

If the septic tank is installed during the dry season, contamination may occur during the rainy season. Furthermore, septic tanks should be placed no less than 50 feet from tributaries to drinking water supplies and no less than 25 feet from lakes, streams and the sea. In coastal areas, however, it is unlikely that a septic tank can be placed this close to the ocean, as sandy soils are poor choices for septic tank locations.



Note: Left – incorrect placement. Right – correct placement of septic tank is at least 25 to 30 m from wells and positioned so that leachate flows away

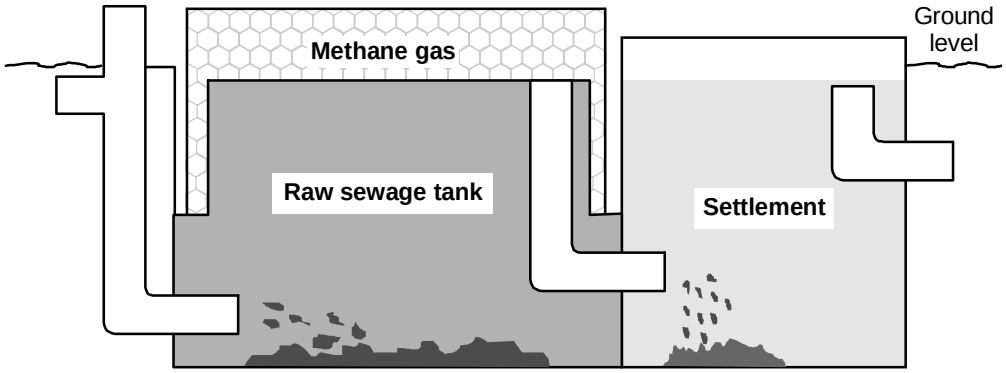
Figure 50: Placement of septic tank in relation to topography and freshwater well (Rees 1990)

Soakage pits

Soakage pits are often too small and the soil conditions are not suitable to provide efficient filtering. By laying out the soil absorption fields in zigzag trenches, the surface area for infiltration can be increased, compared to a square soakage pit. Alternatively, the septic tank can be connected to an engineered wetland cell. These systems are a good option in areas with abundant vacant land. As an added advantage, the effluent from the engineered wetland can be reused or used to recharge a coastal island's aquifer, thus reducing the need for potable water.

Anaerobic digester

Small-scale resorts may use an appropriate technology for waste management, which can be implemented at very low costs (Figure 51). The system is based on an anaerobic digester, which is similar to a septic system. However, the sewage tank will be sealed off to provide anaerobic conditions for the microbes working in the digester. As a product of the bacteria's work, methane gas is captured under the cover of the tank. This gas can be used in the resort for cooking purposes.



Note: Size of raw sewage tank 5 m x 2 m x 2 m, size of settlement tank 3 m x 2 m x 2 m.

Figure 51: Side elevation of a typical brick or concrete anaerobic digester (Reedbed Technology 1998)

In Indonesia, anaerobic digesters are being constructed with locally available and cheap building materials. These are being built with coconut fiber and epoxy resin. A timber mold is erected on-site on which the fiber-resin mix is applied. The tank is then fitted with a rubber lid to capture the methane gas for cooking purposes. The effluent of the anaerobic digester can be polished in an engineered wetland cell (Figure 55).

Engineered wetlands

For coastal resorts and hotels, sewage treatment with 'green' and appropriate technologies such as engineered or constructed wetlands may prove to be a viable alternative to the conventional sewage treatment systems. These engineered wetlands are beneficial in remote areas since they generally do not require much mechanical and electrical equipment and therefore only need little maintenance. The performance of these systems is comparable with sewage treatment plants. They can also be combined with septic systems.

Constructed wetlands are designed to simulate the filtration systems found in nature, by using engineered complexes of saturated substrates, emergent and submergent vegetation, animal life and water. These created wetlands can improve the biological and chemical integrity of water by virtue of their ecological function as "kidneys of the landscape".

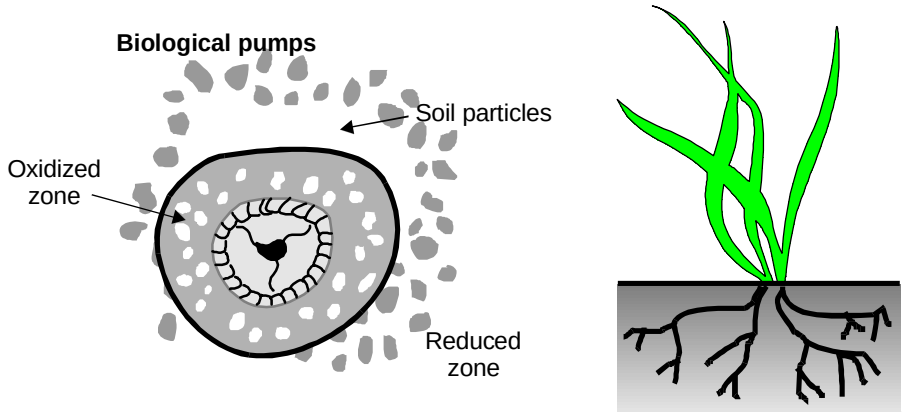
Based on this principle, different designs of engineered wetlands are available. One type is an aquatic system in which floating plants take up nutrients through their roots but perform little actual treatment themselves. They serve instead as an excellent substrate for microbial biomass, which performs the actual treatment. The water hyacinth (*Eichornia crassipes*) has been studied extensively for use in this type of aquatic system. Its major advantages are its extensive root system and rapid growth rate. Other species, such as pennywort (*Hydrocotyle umbellata*) and duckweed (*Lemna* spp., *Spirodela* spp., *Wolffia* spp.) have been used in the same way. These systems can provide effective secondary wastewater treatment or nutrient removal, depending on the organic loading rate. They have been used most often either for removing algae from oxidation pond effluents, or for removing nutrients after secondary treatment.

Another form of constructed wetland uses "rock-reed-filters" in which treatment is generally achieved by filtration, adsorption and microbiological processes (Figure 52). In this method, the root systems of the reeds create an excellent habitat for microbes with an immense appetite for organic pollutants. Oxygen is transported through the root system into the activity zone of the microbes.

Sand and gravel filters provide filtration and water retention to facilitate biological treatment and the elimination of pollutants. Sub-surface treatment of the water helps to prevent odor problems and mosquito breeding. Various combinations of these engineered constructed wetlands have been developed (Figures 53 and 54). The filter media used (typically soil, sand, gravel or crushed rock) greatly affect the hydraulics of these systems.

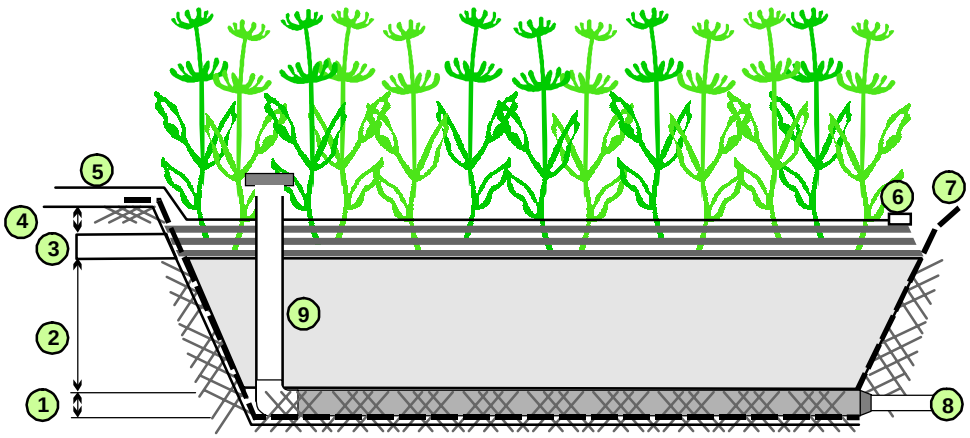
Engineered wetlands can be combined with other sewage treatment systems (PCRF 2000). They serve to polish the effluent and reduce concentrations of nutrients and other pollutants in the water as shown in Figure 55.

As a rule-of-thumb one square-meter of engineered wetland can treat 60 liters of domestic wastewater or sewage per day (PCRF 2000). This formula can be used to estimate the surface area needed to treat a specific amount of water.



Note: An oxidized zone is created around the roots allowing aerobic bacteria to work

Figure 52: Reed root system acts as a biological pump transporting oxygen into the root zone (Hüttche 1999b)



Note: Different layers of filter media (lava stone, gravel or sand) are used (1-4), a surface distribution pipe network (5) distributes the influent to the root system of the planted reeds (6). The whole cell is contained by a membrane or liner (7) to control outflow via a bottom drainage pipe network (8). Ventilation pipes (9) are connected to the drainage pipes for additional oxygen supply

Figure 53: Cross-section of an engineered wetland cell for sewage and wastewater treatment (Hüttche 1999b)

Figure 54: Tropical engineered wetlands used for the treatment of domestic wastewater from hotels and residences can have different designs. One is shown in the photo above; a vertical flow rock-reed engineered wetland cell has dense growth of reeds (*Phragmites communis*). The microbiological treatment takes place in the root zone. Another design, "Wastewater Gardens" concept uses a diverse mix of plants and gravel beds combined with floating hyacinths in small ponds. Both systems can be integrated into a resort's landscape as features (PCRF 2000)

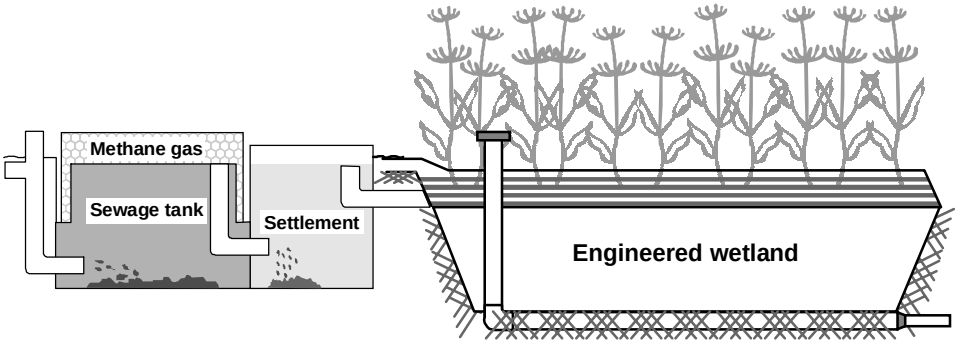


Figure 55: Combination of anaerobic digester and engineered wetland

Sewage treatment plants (STPs)

A wide range of designs and sizes of sewage treatment plants for coastal resorts are available (Figures 56 and 57). The standard system would include a first stage where mechanical treatment takes place, removing larger objects and solids. In the second stage, aerobic biological treatment processes will reduce the organic toxins, optionally aided by aeration. In settlement basins, solids settle as sludge, which can be dried and later reused for soil conditioning purposes. In the final treatment stage, chlorination or ultra-violet light will kill all microbiological pathogens before the effluent is discharged or reused for irrigation purposes.

These systems, if properly constructed and operated, allow generally better effluent qualities than the simpler septic systems. Of course, these systems are more costly as pumps and other equipment are needed and they require proper and skilled maintenance for good performance.

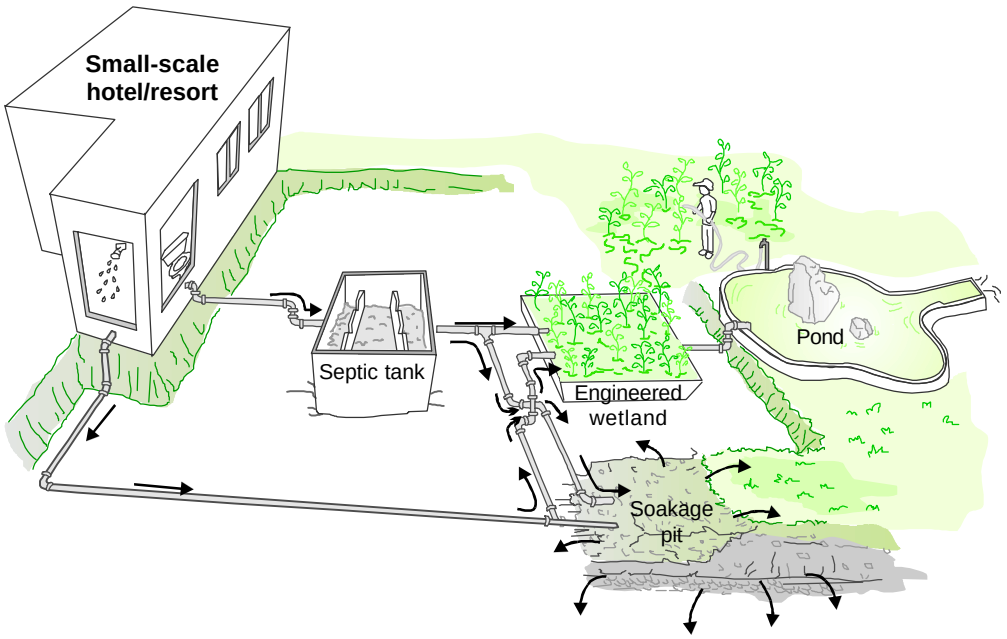
Comparing engineered wetlands with conventional sewage treatment systems shows that engineered wetlands compare favorably in terms of cost and efficacy of cleaning wastewater to acceptable standards for recycling use. Although they require a proper design and skilled maintenance, they are low technology operations that deserve consideration for any medium to large-scale resort. Table 32 shows the relative efficiency of an engineered wetland for reducing selected wastewater parameters.

Table 32. Performance of an engineered wetland (180 m²) at a coastal resort in Indonesia using reed-rock filter system

Test parameters	Wetland inflow (average)	Wetland outflow March 2000*	Reduction (%)	Wetland outflow March 2001	Reduction (%)	International standards**
Total phosphate (mg/L)	27.1	5.6	79	2.1	92	4.0
Biochemical oxygen demand (mg/L)	181	8.0	96	5.0	97	15.0
Chemical oxygen demand (mg/L)	918	30.0	97	36.0	96	50.0
Total suspended solids (mg/L)	212	30.0	86	4.0	98	20.0

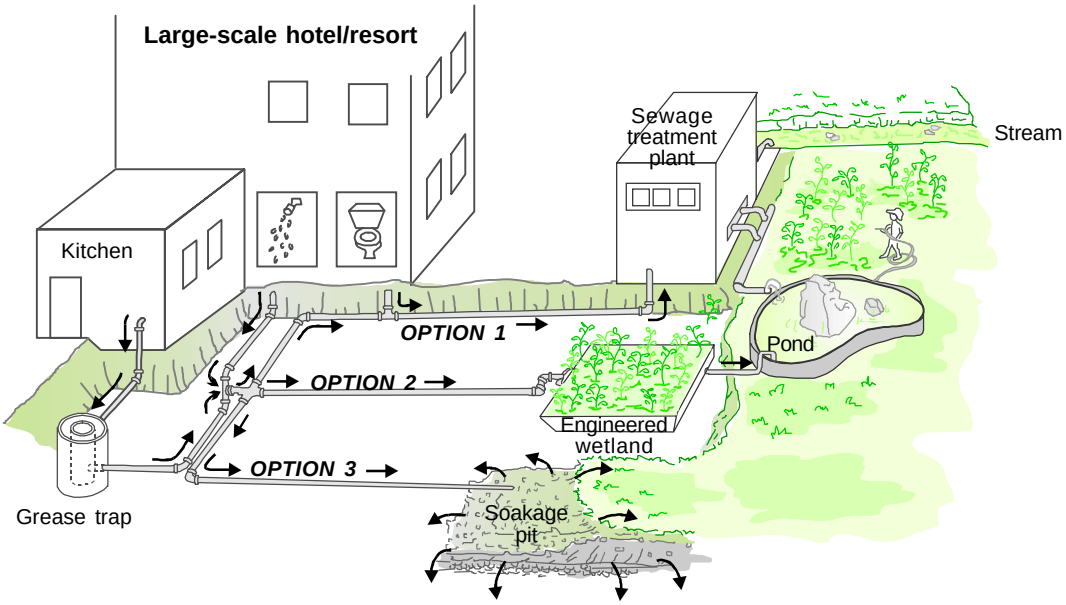
*Engineered wetland operating less than one month so reed root system not fully established
**Comparison with standards used by Bintan Beach International Resort, 1996
Note: Water samples tested by Chemical Laboratory (Singapore) Pte Ltd.

Source: Hüttche (2000)



Note: Less polluted grey water is separately treated in a soakage pit. In order to recycle the water it can be also piped to the engineered wetland instead. The sewage flows into a septic tank for removal of larger solids before being discharged into the wetland cell for treatment. Effluents can be used for irrigation of resort landscape.

Figure 56. Wastewater and sewage disposal options for small and medium-scale coastal resorts and hotels



Note: Kitchen effluent will be treated in a grease trap to separate oil and grease from water. It can then flow into a sewage treatment plant (STP), engineered wetland, or as a minimum solution into a soakage pit (Options 1-3). The same is possible for the hotel's grey water from showers. Sewage from large resorts requires mandatory treatment via STP or engineered wetland to safeguard a sufficient treatment standard. Reuse of effluent is advised. Many resorts discharge STP effluent into a coastal stream or directly into the sea.

Figure 57. Wastewater and sewage disposal options for large-scale coastal resorts and hotels

Reuse for agricultural land or for lawn watering

Although the recycling of treated effluent is strongly recommended, it should meet certain standards to not pose a health hazard to resort staff and visitors. This is to protect workers and guests, especially children, who may get in contact with treated wastewater in public areas like lawns or golf courses. The minimum microbiological water quality requirements for the use of treated wastewater for irrigation are shown in Table 33.

Table 33. Minimum microbiological water quality requirements for the use of treated wastewater for irrigation

Category of reuse conditions and exposed groups	Minimum bacteriological quality requirement (fecal coliform - geometric mean no. per 100 mL)*	Acceptable disinfecting technique #3
Category A - Suitable for irrigation of turf and landscape areas without any restriction of public accesses and crops for human consumption. Exposed group: workers, consumers, public.	<300 fecal coliforms** (This is appropriate for public lawns, such as hotel lawns, and golf courses, with which people may come into direct contact)	30 days ponding to achieve the microbiological quality indicated, or equivalent treatment or other means
Category B - Suitable for irrigation of turf and landscape areas provided the public is excluded during any spray irrigation	<750 fecal coliforms***	20 days ponding, or equivalent treatment, or other means
Category C - Localized irrigation of crops where no contact between reclaimed water and public is likely. Exposed group: none.	<3,000 fecal coliforms***	10 days ponding, or equivalent treatment, or other means

*Treated wastewater to be used for irrigation should have at least (secondary biological treatment) or equivalent process and sedimentation or equivalent process to remove solids.
**WHO 1989, Microbiological Quality Guidelines for Wastewater Use in Agriculture recommends <200 fecal coliforms. The figure of 300 fecal coliform is provided in the EPA of NSW, Australia. Guidelines for the Use of Treated Wastewater by Land Application, 1992.
***EPA of NSW, Australia Guidelines for the Use of Treated Wastewater by Land Application, 1992. Disinfection by chlorination or any other means will only be approved if site constraints or other factors preclude the provision of ponding facilities

Source: BBIR (1996)

Septic tank/grease trap maintenance

Depending on the volume and loading of the septic tank or grease trap, sludge or grease cake will fill up the tanks' compartments over time. In order to allow proper functioning, the tanks need to be dislodged regularly. The tanks' compartment should not be more than 1/3 filled with sludge or grease cake. Products to reduce sludge include: special bacteria blends, specifically chosen for their accelerated ability to metabolize organic solids, grease, fats, proteins, lipids and detergents into carbon dioxide and water. These products are available in tablet or liquid form. Application is easy by dropping one or two tablets per month into the septic tank. They boost the performance of the septic tanks and grease traps and improve the effluent quality significantly. Cost-savings are possible, as the products reduce the frequency of cleaning through less sludge buildup.

Stormwater and Surface Runoff

Water flowing on the surface during or immediately after a rainstorm is called stormwater runoff. Property damage, flooding, death, water pollution and erosion may all result from stormwater runoff. Therefore, coastal tourist facilities must be designed to limit changes to natural runoff patterns and to compensate for those disruptions that are unavoidable. Objectives for stormwater management are listed in Table 34.

Table 34. Objectives for stormwater management

- Prevent flooding resulting from stormwater surges
- Prevent pollution of surface, ground and coastal waters by removing pollutants acquired from septic systems, pesticides or other pollutants
- Recharge groundwater to minimize potential water shortages during periods of little rainfall
- Prevent soil cave-ins and damage to building foundations
- Prevent soil erosion which causes damage to streams, lakes and coastal waters
- Prevent sedimentation of adjacent water bodies
- Prevent clogging and backup of storm drains and channels
- Protect wildlife and habitats (coral reefs, mangroves, etc.) from sedimentation and pollution
- Protect open spaces, wetlands and recreational waters to enhance the surroundings

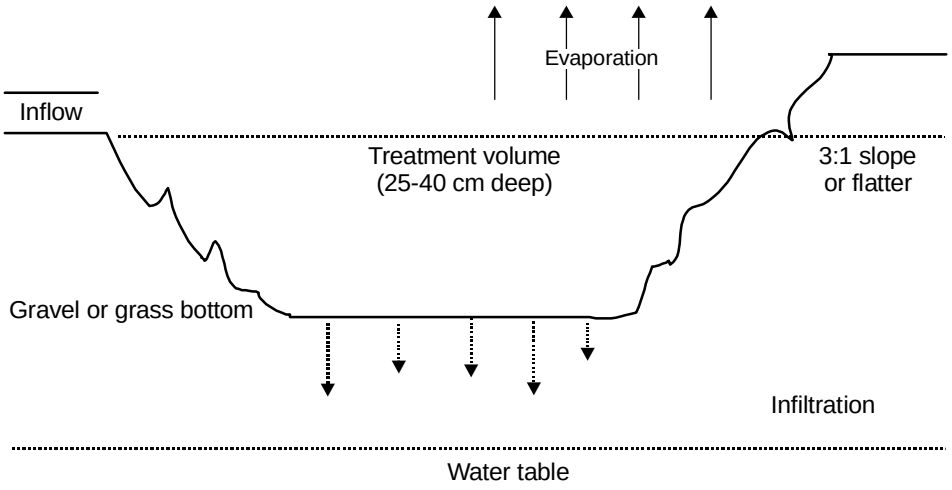
Runoff from developed areas can contribute large amounts of suspended materials, nutrients, and BOD as well as freshwater influx to coastal waters, all of which are detrimental to coastal ecosystems. Further, as coastal development not only increases the quantity of runoff but also lowers the quality, runoff must be properly treated and routed to minimize impacts to coastal ecosystems. Stormwater often carries more pollutants than untreated wastewater and causes greater degradation of coastal waters, lakes and streams.

Runoff is difficult to control, but can become almost impossible once the construction of the development is complete. In the past, runoff was treated as a secondary issue to be dealt with as it occurred and not something to plan for. Currently, greater emphasis is placed on planning for stormwater by determining pre-development discharge rate standards and using as a baseline standard. This standard requires that the rate, volume, and content of stormwater discharge after development must not be greater than the rate, volume or content before site development occurs. Planners must consider stormwater in the context of coastal tourism development. These actions help minimize the impact of runoff:

- Minimize disturbances to the existing landscape;
- Minimize paved areas such as roads and parking areas;
- Use shrubs which require little or no fertilizer; and
- Use contouring to divert runoff to storage areas.

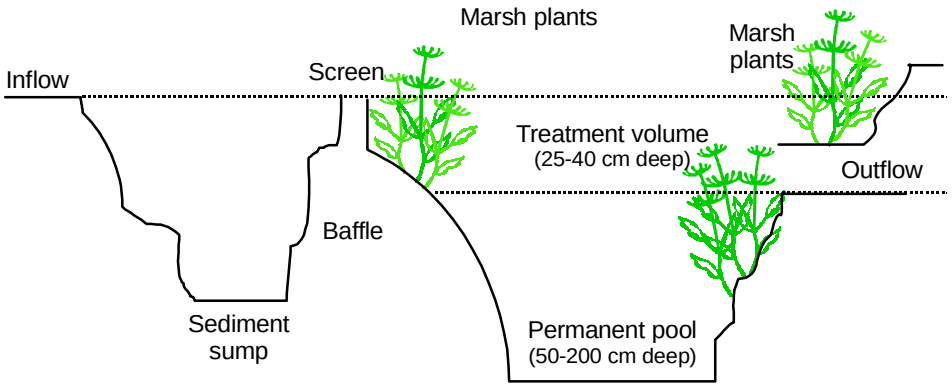
Stormwater storage areas could be either of a permanent type such as reservoirs, or of a temporary nature such as large low-lying areas where evaporation would be enhanced (Figures 58 and 59). The runoff could be used for irrigation or discharged after treatment via a submarine outfall.

If large areas of closed surfaces are unavoidable, materials such as bricks and cobbles should be used instead of asphalt or cement. The spaces between individual bricks allow water to seep into the soil reducing runoff. Vegetation may also be used to filter water and allow percolation and groundwater recharge (Figure 60).



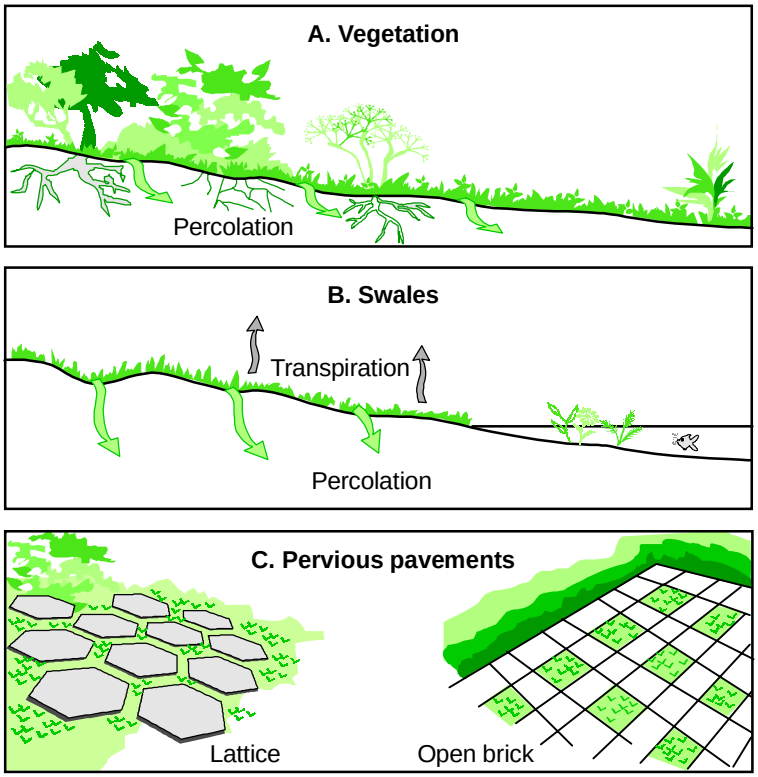
Note: Runoff is held in the basin until it evaporates or is absorbed into the soil. No discharge occurs in this system.

Figure 58. A dry retention basin is one option for collecting stormwater (Branan *et al.* 1991)



Note: In coastal areas this limits water inundations associated with large rainstorms

Figure 59. A wet retention pond is another option for stormwater storage in which stormwater is held and discharged at a rate determined by the size of the outflow pipe (Branan *et al.* 1991)



Notes: **A.** Provides a ground cover that permits rain to percolate into the ground, preventing runoff flooding while recharging groundwater
B. Grass-lined troughs that collect runoff and allow time for water to percolate into the ground. Swales must be moved to keep the vegetation healthy and to prevent outlet plugging from leaves, garbage or litter.
C. Gravel, brick or other pervious surfaces. Separations or pore spaces must be sufficient to allow rapid percolation of rainwater.

Figure 60. Several landscaping techniques that help to minimize stormwater runoff damage (Branan *et al.* 1991)

Parameters to consider in the design of a stormwater disposal system are either system specific or event specific. In system specific parameters, the most important consideration is the coefficient of runoff of the catchment area in relation to the actual catchment area. The coefficient of runoff is dependent on the following factors:

- Form, location and size of the catchment area;
- Type of land-use;
- Infiltration rate and groundwater table;
- Slope of ground within the catchment area;
- Existence, location, length, size, gradient and condition of the drainage system or canals; and
- Size, location and capacity of the retention areas.

Event specific parameters are governed by the intensity of rainfall. For example, an intensity of rainfall of 110 mm/hour based on a storm duration of 15 minutes with a return period of 1 year for open drains requires a certain size drain to channel the water.

This intensity of rainfall would require large culvert and drain sizes. If the system being designed for becomes too expensive, then a slightly less intensity rainfall could be used for the average storm event such as: rainfall of 90 mm/hour based on a storm duration of 15 minutes with a return period of three months. For culverts and other structures, an intensity of rainfall for 125 mm/hour based on a storm duration of 15 minutes with a return period of two years could be used. These figures will depend on rainfall data from the area of the development and overall design criteria.

Stormwater collection systems

Stormwater collection systems should be designed according to the desired velocity of the flow and for ease of maintenance. Closed drains should be provided only if:

- Road width is limited;
- Where drains are deeper than 0.75 m; and
- Where open drains are not aesthetically appropriate.

Stormwater from the collection system should be discharged through outfalls to natural watercourses, to larger drains or canals, to retention ponds or marshes, or to a soakage system or engineered wetland cell. The discharge through the outfall should be via a silt trap and a screen to prevent debris collected in the open drains from being discharged through the outfall. The placement of the outfall pipes into natural waterways should be in areas with large amounts of flushing and away from coral reefs and other coastal habitats, which may be damaged by the outfall.

It is important to avoid discharge of stormwater into resort beach areas, either through artificial or natural drains. This can lead to pollution of beaches with debris and silt. During heavy rains the high velocity of the stormwater can lead to beach erosion. This can seriously affect the attractiveness of the beach areas for tourists and requires intensive mitigation. Discharge of stormwater should be channeled towards stable rocky headlands or outcrops, provided no other coastal ecosystems such as coral reefs are impacted.

Summary

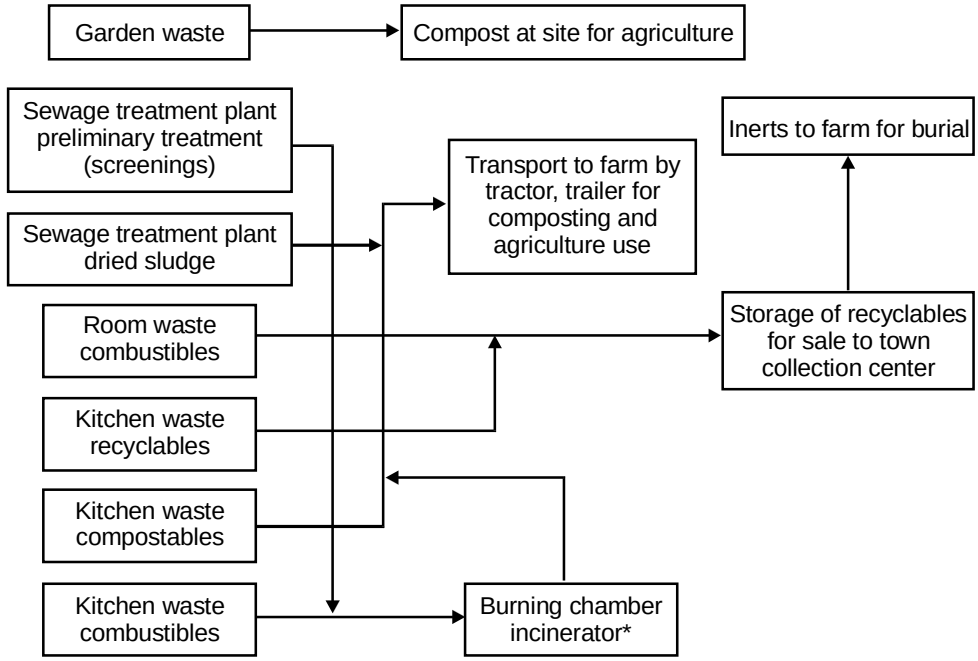
Along with any water supply scheme, there must be an appropriate plan for disposal of wastewater, stormwater and sewage. Untreated sewage is one of the major sources of environmental pollution in the coastal areas once resorts are operational. Planning for wastewater treatment and recycling should be done in the design phase and be adequate to accommodate expansion of the resort. The technology and designs are available for very cost-effective and water saving systems for dealing with wastewater. Very little if any wastewater needs to enter the ocean since all grey water can be used for gardening and toilet flushing. Stormwater runoff needs to be planned for and channeled away from the sea as much as possible. The solutions are as broad as the imagination while an appropriate mix for any given facility must be selected and can produce a truly clean operation.

CHAPTER 10

Solid Waste Disposal

Solid waste is a predictable product of any resort. The technology to manage, treat, recycle and dispose of it is available—let's use it!

Disposal of solid wastes (plastics, glass, paper, leftover food) is a difficult process in most tropical developing nations. However, organic wastes can be processed fast due to high temperatures suitable for microbial digestion of the waste. Proper separation and processing of organic matters from resort operations are essential for success as suggested in Figure 61.



*controlled by Solid Waste Management Act No. 90-03

Figure 61. Possible methods of solid waste disposal in a hotel (modified from Sullivan *et al.* 1995)

Waste management during the construction phase

Land clearing, organic construction debris and vegetation waste shall be disposed of on-site. Shredding or burying are acceptable means of disposal. Open waste burning shall not be the first choice and only takes place at controlled sites. The dumping of trash and debris on adjacent properties or other locations in and around the development site should not take place.

Dumping of used oil, leftover paint or other hazardous materials shall not take place on-site or into wastewater and sanitary sewer systems. Materials shall, instead, be taken to waste recycling and processing facilities. The contractor should be made responsible for the disposal of these materials and their proper disposal should be monitored.

Petroleum, oil and lubricant storage, and transfer activities, including equipment fuelling and maintenance, shall be handled in a manner to minimize the potential for spills and must be conducted in pre-approved areas. These areas shall be bermed and lined to contain potential spills. This reduces the risk of contaminated soils, which pose environmental problems for disposal.

Waste management during operations

Composting of garden wastes (cut grass, dead flowers, tree and shrub limbs) is an excellent way of producing rich soils. By removing garden wastes, nutrients are taken away from the soils, resulting in the need to apply more fertilizer. If garden wastes are composted and the new soils reapplied, the area will not lose its nutrients and less money will have to be spent to replenish soils. Distribution of kitchen and dining room wastes to local farms is also an excellent way to reduce the amount of trash to bury or burn or place in a landfill.

Improper solid waste disposal always detracts from the environment, repels visitors and causes health risks.

Total waste treatment and management technologies are available. These systems or bioconverters take in kitchen wastes, sewage and wastewater to produce compost (soil conditioner), biogas and useable water. The system not only treats most waste (except certain solid recyclable, which is separated), but also produces useful products. Such systems should be explored for use in all hotels and resort developments.

SUMMARY

Solid waste management is essential for environmental and human health as well as for the economic well-being of tourism facilities. The Philippines generally lacks adequate waste management systems on a large scale so that resort developers and local governments must plan for solid waste storage and disposal methods for the proposed tourism facility. Solid waste management technology and solutions are now available that are not expensive and much waste can be recycled with an economic return to the facility.

CHAPTER 11

Environmental Control and Auditing

Environmental management and monitoring is required throughout the entire life of a project and is the responsibility of the developer and operator.

The EIA process does not stop with the completion of the EIS and the granting of an ECC. Environmental control is a powerful tool for the coastal tourism operator to streamline operations, minimize major environmental repair measures through early detection and improve the quality of housekeeping.

Efficient control is achieved by implementing an environmental monitoring program. Environmental monitoring is a planned and systematic data collection activity, carried out repeatedly. Environmental monitoring should ensure that the project does not cause any significant long-term environmental impacts, in particular cumulative impacts (e.g. sewage), and that the existing environmental conditions are maintained to ensure the long-term feasibility and quality of the project.

Who Monitors?

In the Philippines, the EIA legislation requires the setup of a Multi-Partite Monitoring Team (MMT) and an Environmental Monitoring Fund (EMF) for projects requiring an EIS. The MMT should conduct an independent review of the project's compliance with the EIS, starting from construction throughout the operations stage. The MMT will set an operating plan and schedule.

The core members of the MMT are: the project proponent, affected communities and women through their designated representatives, the relevant LGUs, the DENR Provincial and/or Community Environment and Natural Resources Officers (PENROs/CENROs) in the project areas. Other members may be identified. DENR will provide

technical support. The project proponent and later the operator should establish the EMF to be used for the activities of the MMT.

Due to cost and time constraints, the MMT activities may take place at longer time intervals (e.g. annual, six-monthly, etc.) *during* project operations. Daily, weekly or monthly monitoring activities have to be an easy-to-implement and inexpensive exercise as it continues for many years. This is easiest achieved if environmental monitoring is part of the coastal resorts' routine maintenance and housekeeping programs carried out by the resorts' staff. In many cases, visual controls and recording of the results can do the job.

An initial environmental monitoring training may be required for key resort staff (e.g. engineer, housekeeper, gardener, dive operator). Good environmental quality and management standards achieved by regular monitoring is definitely a plus in the eyes of many tourists (see case study: Boracay Island). Environmental monitoring responsibilities and topics for coastal tourism are outlined in Tables 35 and 36.

Table 35. Proposed environmental monitoring responsibilities for coastal tourism in the Philippines

Who	Responsibilities	Tasks
Multi-Partite Monitoring Team **Core team:** The project proponent, affected communities and women through their designated representatives, the relevant LGUs, the DENR Provincial and/or Community Environment and Natural Resources Officers (PENROs/CENROs) **Additional members** (to be identified by core MMT): Examples: BFAR, DOT, DA, NGOs, Marine Scientists/Consultants/ Universities	• Overall compliance monitoring based on EIS • Stakeholder inputs by affected parties	• Review proponent's/operator's environmental monitoring reports • Independent monitoring activities of major parameters (e.g. seawater quality, reef health) • Effects on neighboring communities • Recommendations to proponent/ operator and DENR for further actions
OPTIONAL: Tourism developer/operator	• Day-to-day environmental monitoring routine • Submission of environmental monitoring reports to MMT for evaluation	• Integrate frequent monitoring activities in routine maintenance and housekeeping programs • Organize monitoring training for key result staff • Proper recording of monitoring data • Benefits: Streamline management activities, improve quality and cost-efficiency, minimize major environmental repairs through early detection

Table 36. Sample environmental monitoring form for weekly monitoring

Weekly Site Environmental Monitoring Form

For the month of					
Monitored by **Name**		**Signature**			
	Week				
	1	2	3	4	(5)
Status of re-vegetation efforts					
Grease trap inspection					
Sludge depth (<1/3-1/2 full)					
Pipe blockage					
Refill with water					
Other comments					
Bin center inspection					
All loose litter in bins					
Drains clear					
Floor cleaned					
Surrounding apron and walls cleaned					
Stains and dirt removed					
Any foul smell					
Remarks					

Rate	**1 = adequate**	**2 = requires improvement**	**3 = requires immediate action**
Comments			
Actions			
Form assessed and approved by	**Name**	**Signature**	**Date**

Different environmental parameters require different monitoring frequencies. Some will be monitored daily, weekly or monthly, others are checked every six months or once a year. For example, construction activities need to be checked daily during monsoons for efficient erosion control and surface runoff protection. During coastal tourism operations, sewage discharge standards can be checked monthly.

Source: Hüttche (1998c)

Environmental Audits

Environmental audits are regular environmental evaluations of whole operations. Audits go further than checking the compliance with an environmental regulation or standard. In coastal tourism projects an auditor would assess, for instance, the consumption of resources such as water and energy. The goal of the environmental audit at resorts and hotels would be to identify resource-saving means of operating through energy or water conservation measures. This can lead to substantial cost-savings for the hotel or resort operator. An example of a self-audit form for hotels and resorts is presented in Table 37.

Table 37. Sample self-audit form for hotels and resorts

Waste management

a. Monitoring annual waste volume

Yearly waste	Previous year volume (tons)	Current year reduction (tons)	Year on year reduction (tons)	Year on year reduction (%)	Target for reduction	Achieved target? (x/✓)
Sorted						
Unsorted						

a. Percentage of materials recycled

Waste	Previous year (%)	Current year	Target for recycling	Achieved target? (x/✓)
Aluminum				
Other metals				
Glass				
Plastic				
Organic (including food)				
Paper				
Card				
Other				

Energy and water conservation

a. Monitoring energy and water consumption

Yearly consumption	Previous year	Current year	Year on year reduction (amount)	Year on year reduction (%)	Target for reduction	Achieved target? (x/✓)
Electricity (kWh)						
Gas (kWh)						
Oil (liters)						
Steam/hot water (kWh)						

(continued)

Table 37. (continued)

Yearly consumption	Previous year	Current year	Year on year reduction (amount)	Year on year reduction (%)	Target for reduction	Achieved target? (x/✓)
Steam (kWh)						
Water (m^3)						
Other						

Product purchase

a. Monitoring the switch to environment-friendly products: percentage of purchase

Puchases	Previous year (%)	Current year	Target for recycling	Achieved target? (x/✓)
Energy-efficient appliances				
Locally produced food and products				
Furniture-wood from sustainable sources				
Biodegradable toiletries				
Phosphate-free detergents				
Reusable napkins, cups, dry-cleaning covers				
Oxygen bleaches				
Ozone-friendly aerosols				
Organic fertilizers and biocides				
Recycled paper				
Other items made from recyclable materials				
Returnable bottles				

External air emissions

a. Quantities of refrigerants purchased

Yearly quantities	Previous year	Current year	Year on year reduction (amount)	Year on year reduction (%)	Target for reduction	Achieved target? (x/✓)
Chloroflourocarbon						
Hydrochloroflourocarbon						
Other						

Pesticides and herbicides

a. Monitoring the reduction in pesticide use

Yearly quantities	Previous year	Current year	Year on year reduction (amount)	Year on year reduction (%)	Target for reduction	Achieved target? (x/✓)
Pesticides						
Herbicides						

With the results of regular monitoring and audit schemes, coastal resort and hotel operators can identify areas of good performance and areas for improvements. It might help to compare the environmental performance with internationally accepted benchmarks. Table 38 shows the performance benchmark for tropical hotels for energy consumption, efficiency and water consumption. The following case study also highlights how environmental monitoring can be institutionalized.

Table 38. Energy and water conservation benchmarks for hotels in tropical countries

	Correction factor	Good	Fair	Poor	Very poor
Large hotel (>150 rooms)					
Electricity (kWh/m²/year)		**165**	**200**	**250**	**>250**
	1.3	214.5	260	325	325
	1.6	264	320	400	400
Energy[1] (kWh/m²/year)		**200**	**240**	**300**	**>300**
	0.4	80	96	120	120
	0.7	140	168	210	210
Water[2] (liter/guest/day)		**600**	**770**	**880**	**>880**
	1.3	780	1,001	1,144	1,144
	1.6	960	1,232	1,408	1,408
Medium hotel (50-150 rooms)					
Electricity (kWh/m²/year)		**70**	**90**	**120**	**>120**
	1.3	91	117	156	156
	1.6	112	144	192	192
Energy[1] (kWh/m²/year)		**190**	**230**	**260**	**>260**
	0.4	76	92	104	104
	0.7	133	161	182	182
Water[2] (liter/guest/day)		**440**	**500**	**600**	**>600**
	1.3	572	650	780	780
	1.6	704	800	960	960
Small hotel (4-50 rooms)					
Electricity (kWh/m²/year)		**60**	**80**	**100**	**>100**
	1.3	78	104	130	130
	1.6	96	128	160	160
Energy[1] (kWh/m²/year)		**180**	**210**	**240**	**>240**
	0.4	72	84	96	96
	0.7	96	147	168	168
Water[2] (liter/guest/day)		**330**	**380**	**440**	**>440**
	1.3	429	494	572	572
	1.6	528	608	915.2	915.2

Source: Balifokus (2000)

[1]Energy derived directly from petroleum products (gasoline, diesel or natural gas)

[2]Water consumption includes drinking, shower, toilet, cooking and irrigation water for gardens per guest. Tropical resorts with extensive gardens that use potable water for irrigation have a high water consumption per guest and thus a poor performance. The solution is to use treated effluent and not potable water for landscape irrigation.

CASE STUDY:
BINTAN RESORTS, BINTAN ISLAND, INDONESIA

At Bintan Resorts along Bintan's northern shoreline, all individual developers are required to submit a six monthly environmental monitoring report to the authorities. The developers conduct most of the monitoring activities in-house, with assistance from specialists for routine biodiversity assessments of coral reefs, etc. The reports are submitted to Bintan Resort Management Pte Ltd. There, the reports are compiled and checked by an Environmental Officer. A summary report with recommendations by the Officer is produced for all resorts, which will be finally submitted to the Indonesian Environmental Management Agency in Jakarta, Indonesia, for review and approval. In severe cases of non-compliance, the developer and operator could eventually lose their operating license.

IMPORTANT: The Environmental Officer performs on-the-ground spot checks to ensure the resorts are reporting realistic monitoring results. Without these "cross checks" the Indonesian Environmental Management Agency would not be able to fully assess compliance.

SUMMARY

Environmental control and auditing plays an important role in maintaining the original good plans of a coastal tourism operation. Most resorts start out with a well-planned operation but after some time may tend to stop monitoring their own operations carefully. Small infractions may turn to larger ones to the detriment of the on-site and off-site environment. A simple audit procedure that checks all aspects of resort operation impacts on environment from energy use, water consumption, waste disposal of all kinds and other aspects of the resort operation can prevent this from occurring. More often than not, keeping good records and maintaining a vigilant watch on a resort operation with respect to environment will translate into a clean, green and more attractive and profitable facility.

CHAPTER 12

The Future: Building Capacity for Sustainable Coastal Tourism

Sustainable solutions and 'green' technologies are only as good as the people who implement them daily. That's why stakeholder and staff awareness and training are of great importance to make coastal tourism sustainable.

This handbook, augmented by the *Philippine Coastal Management Guidebook Series* (DENR *et al*. 2001), provide technical materials for various stakeholder groups. For intensive training workshops (3-5 days), it is advised to structure the training components into sessions.

The training sessions on sustainable coastal tourism can be linked to the integrated coastal management (ICM) approach, as tourism is an integral component of coastal zone utilization. Coastal tourism shares its resources with other users (e.g. fishing). Environmental and social impacts from coastal tourism may affect these other resource usage and vice versa.

In general, ICM training aims to enhance the participants' awareness of coastal environmental issues and appreciation of the ICM approach to address these challenges.

A training workshop on sustainable coastal tourism in the framework of ICM is outlined here with proposed individual sessions in a logical order. However, each of the sessions can be delivered individually or combined as the target audience requires. The materials for the sessions can be extracted from this handbook.

Session 5: Strategies and actions

Objectives

At the end of the session, participants will be able to:

- Understand the meaning of strategies and action plans;
- Formulate strategies and action plans for sustainable coastal tourism; and
- Develop a regional ecotour product plan as a key strategy.

Session 6: Ecotour product development

Objectives

At the end of the session, participants will be able to:

- Conduct a simple tourism market analysis for small and medium-size business;
- Determine the financial pre-feasibility of the business;
- Understand the process to set up a professional tourism business; and
- Explore available niche markets for community-based ecotourism.

Session 7: Environmental management and auditing

Objectives

At the end of the session, participants will be able to:

- Describe 'green practices' for coastal tourism management;
- Understand the marketability of 'green practices' to ecotourists;
- Outline 'green conciousness' and training for staff and management;
- Describe the process of evaluation using indicators; and
- Explain the importance of a reporting system in monitoring and evaluation.

SUMMARY

Building capacity for managing coastal tourism is a multifaceted undertaking. The variety of institutions and persons involved in assisting the design and implementation of coastal tourism is indeed very large. It is not possible to build capacity uniformly among this wide range of stakeholders and institutions. Nevertheless, ongoing training and education is essential to improve the awareness of people in the tourism industry about the need to look for and implement sustainable solutions. And, the solutions are not only on-site but more often than not the context of any one tourism establishment is equally or more important than the actual operation of the facility. This is why a wider appreciation of ICM planning is essential. If tourists come to a nice beach with all the services and then swim or scuba dive on a dead coral reef resulting either from pollution or destructive fishing, the tourist will probably not return. Building this broad awareness among resort planners and operators must be the theme of training for the future.

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